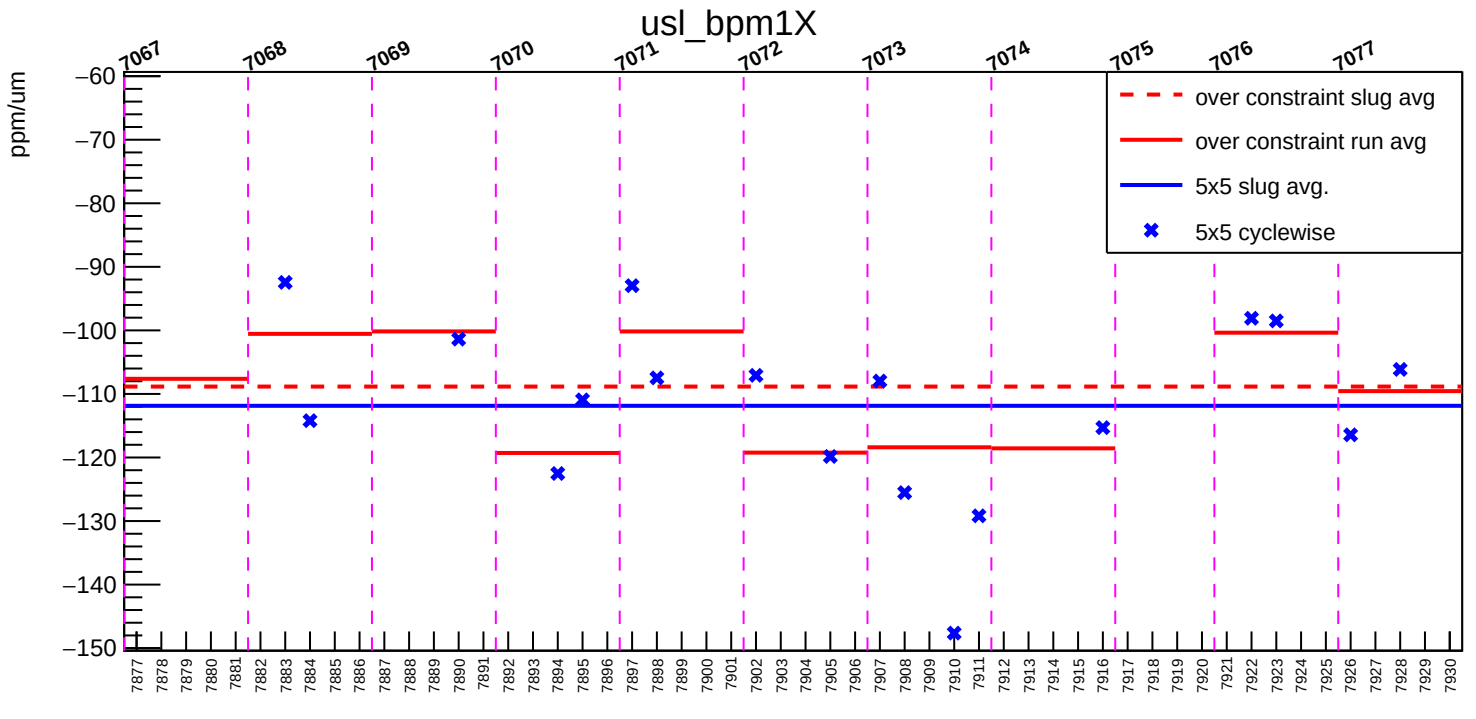
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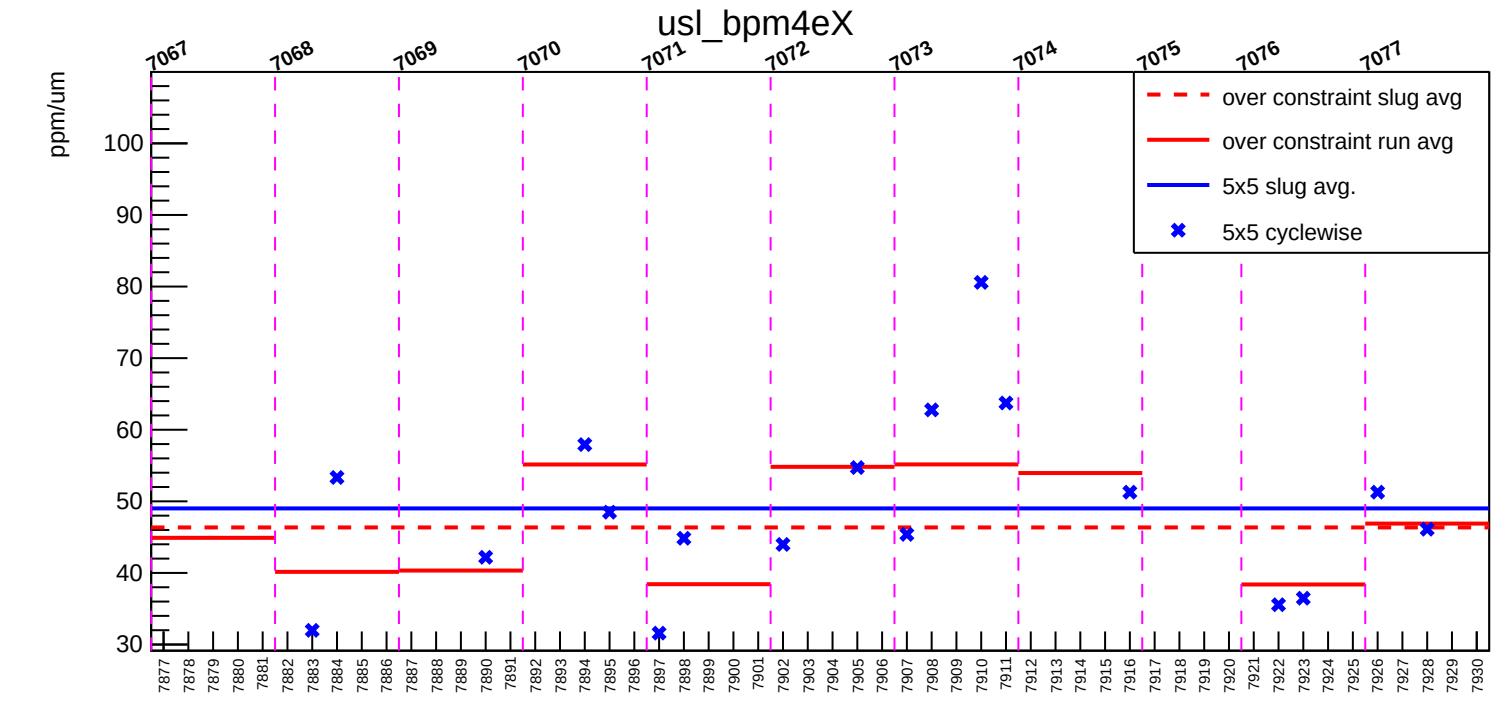
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5x5 cyclewise
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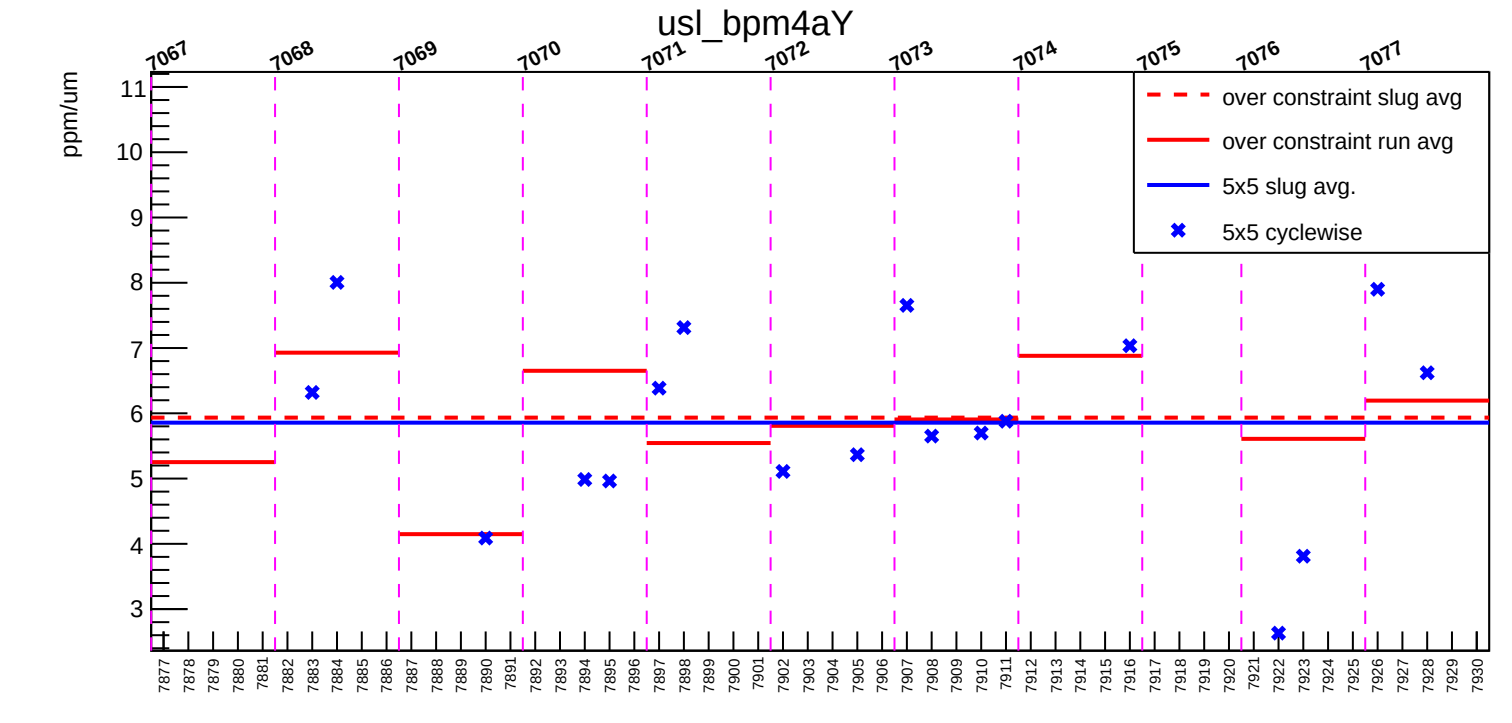
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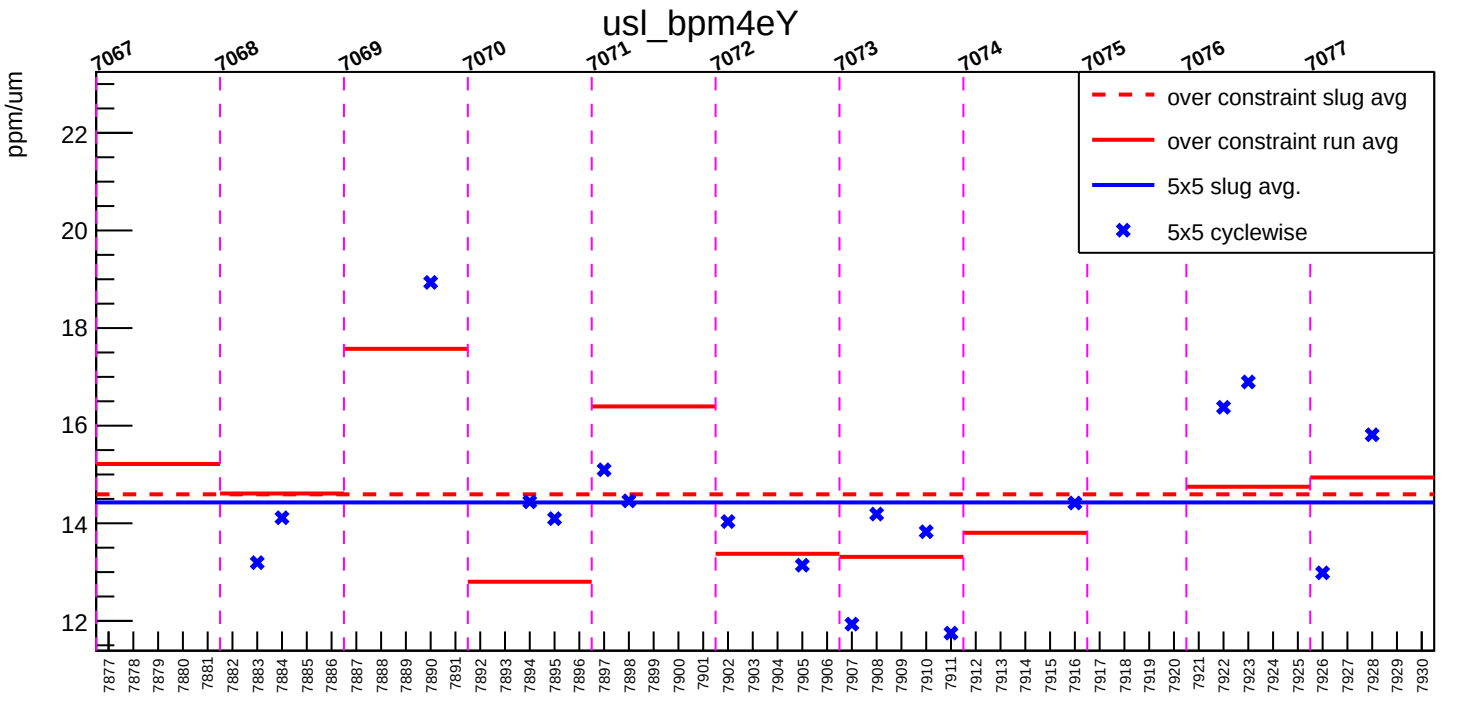
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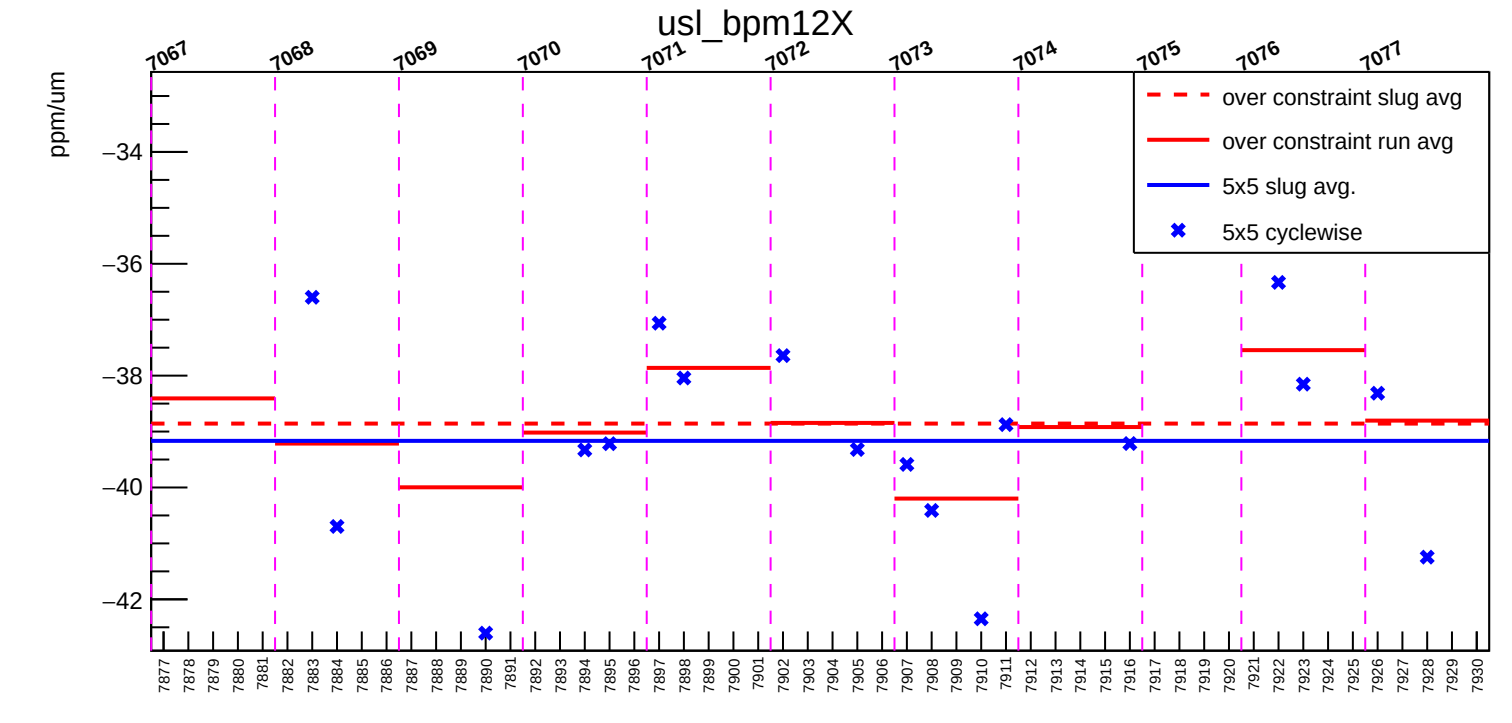
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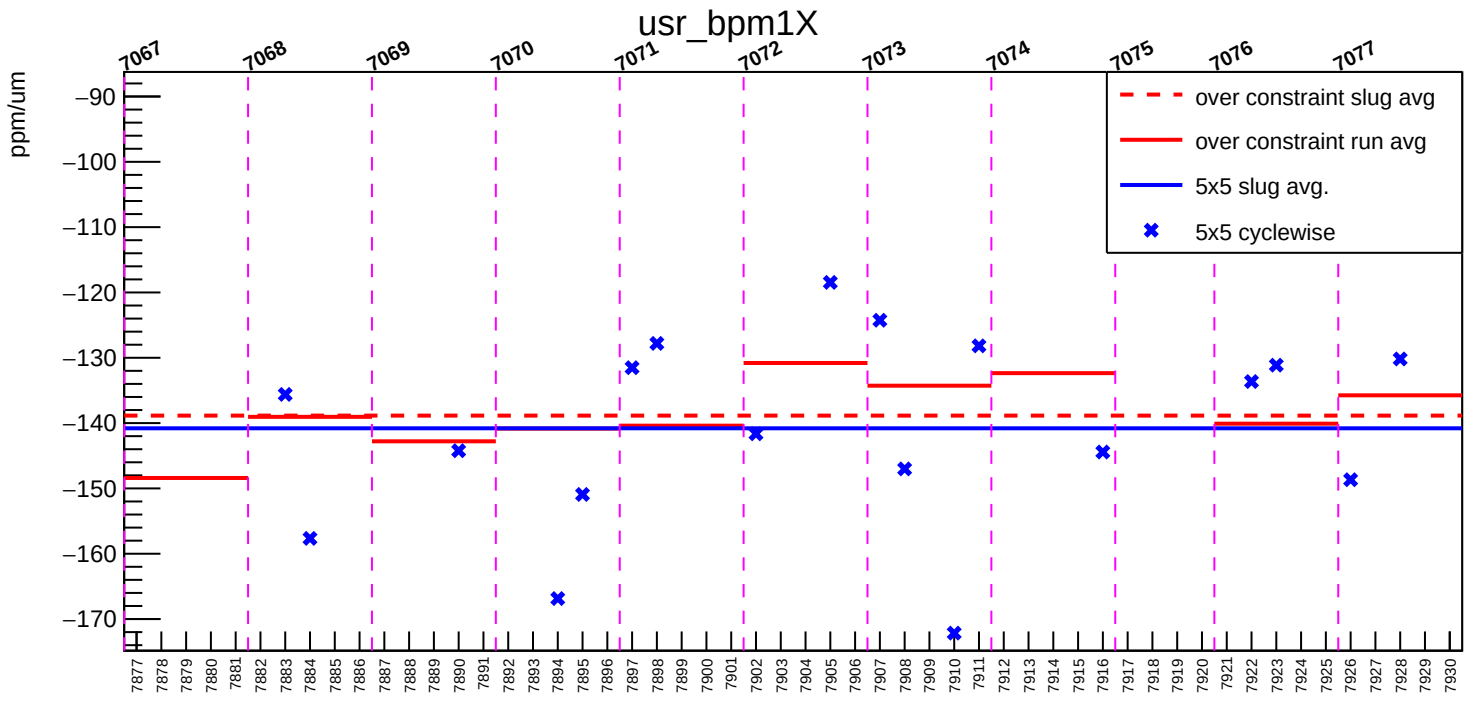
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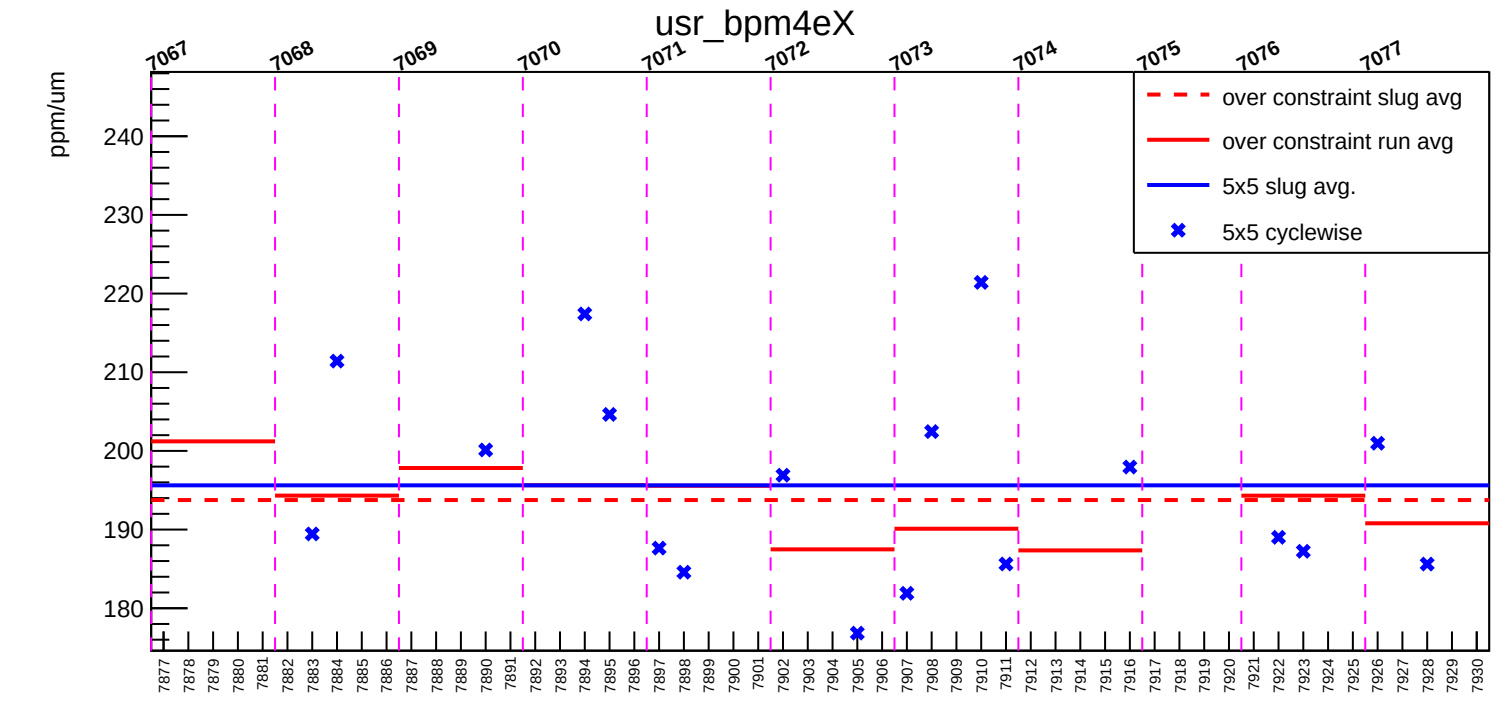
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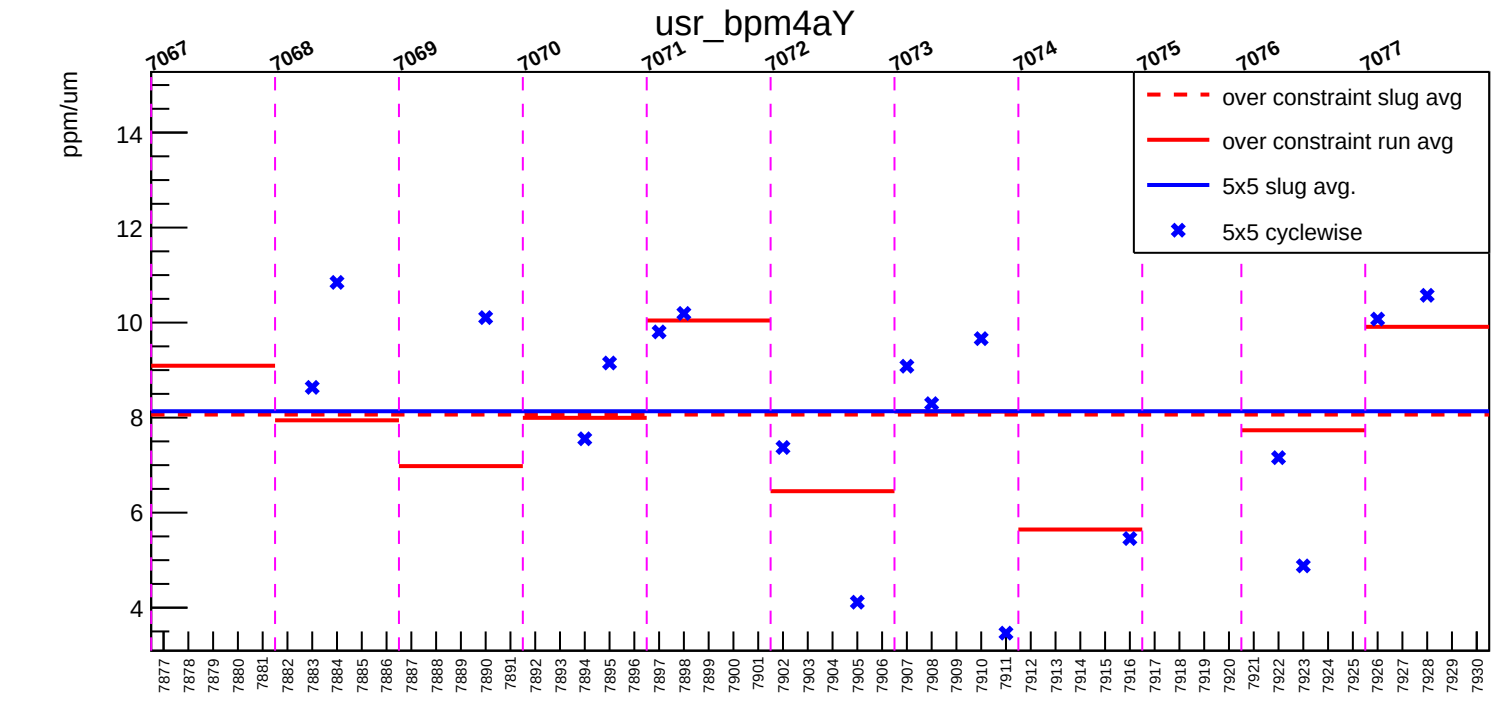
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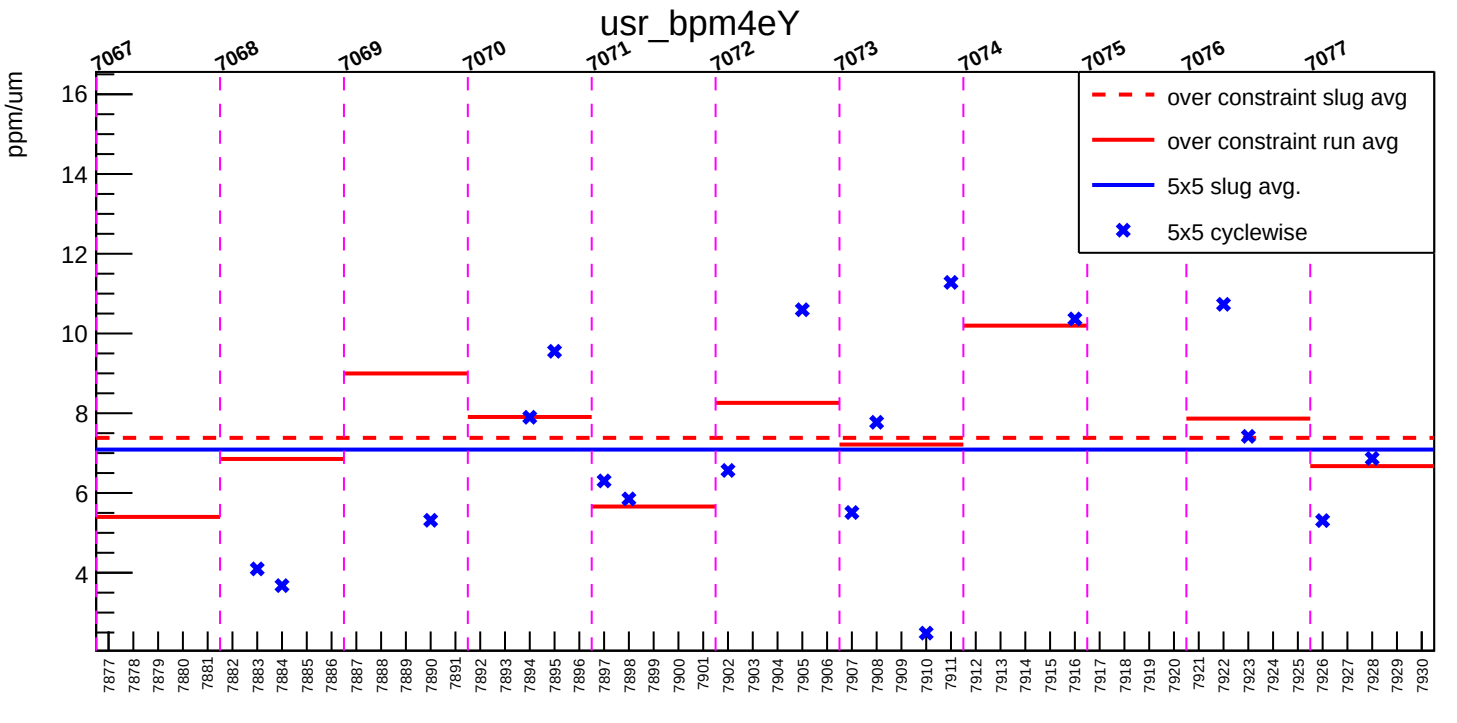
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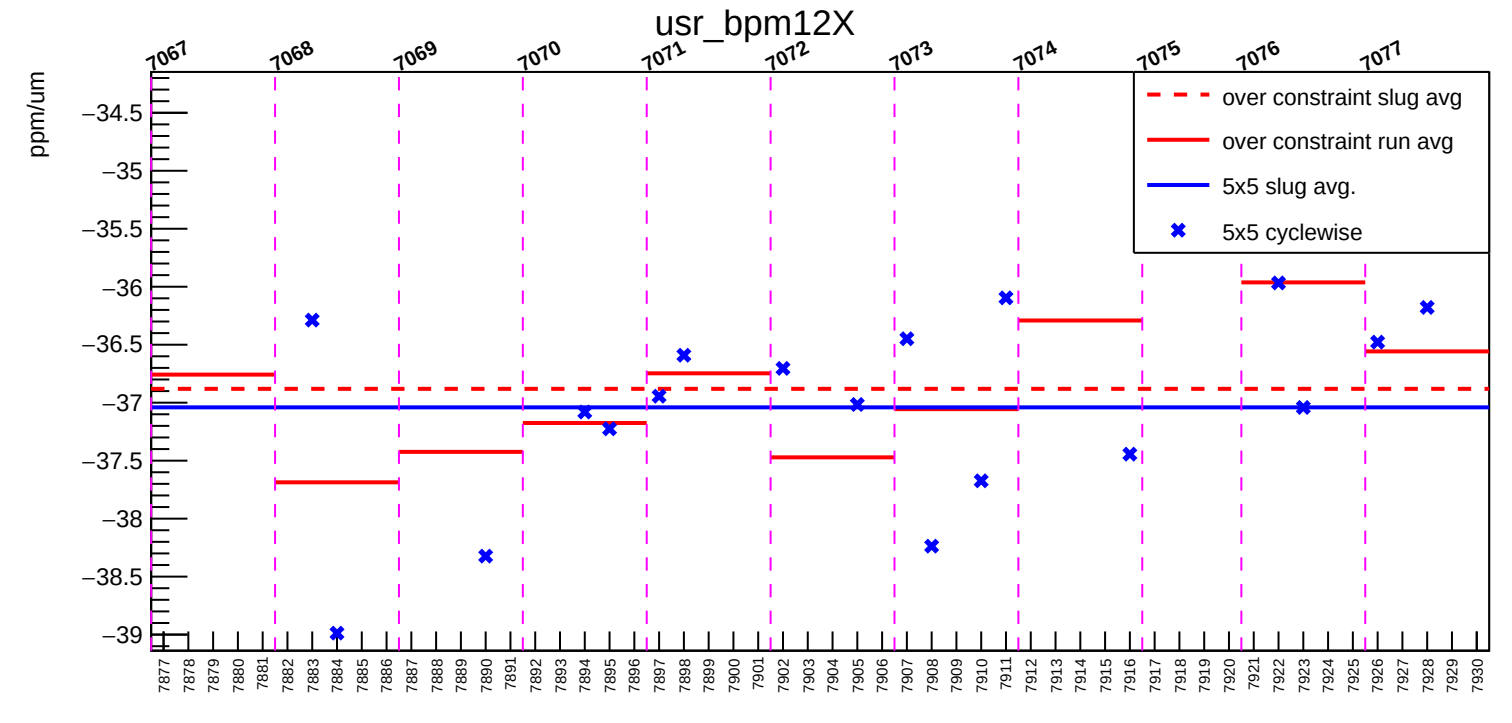
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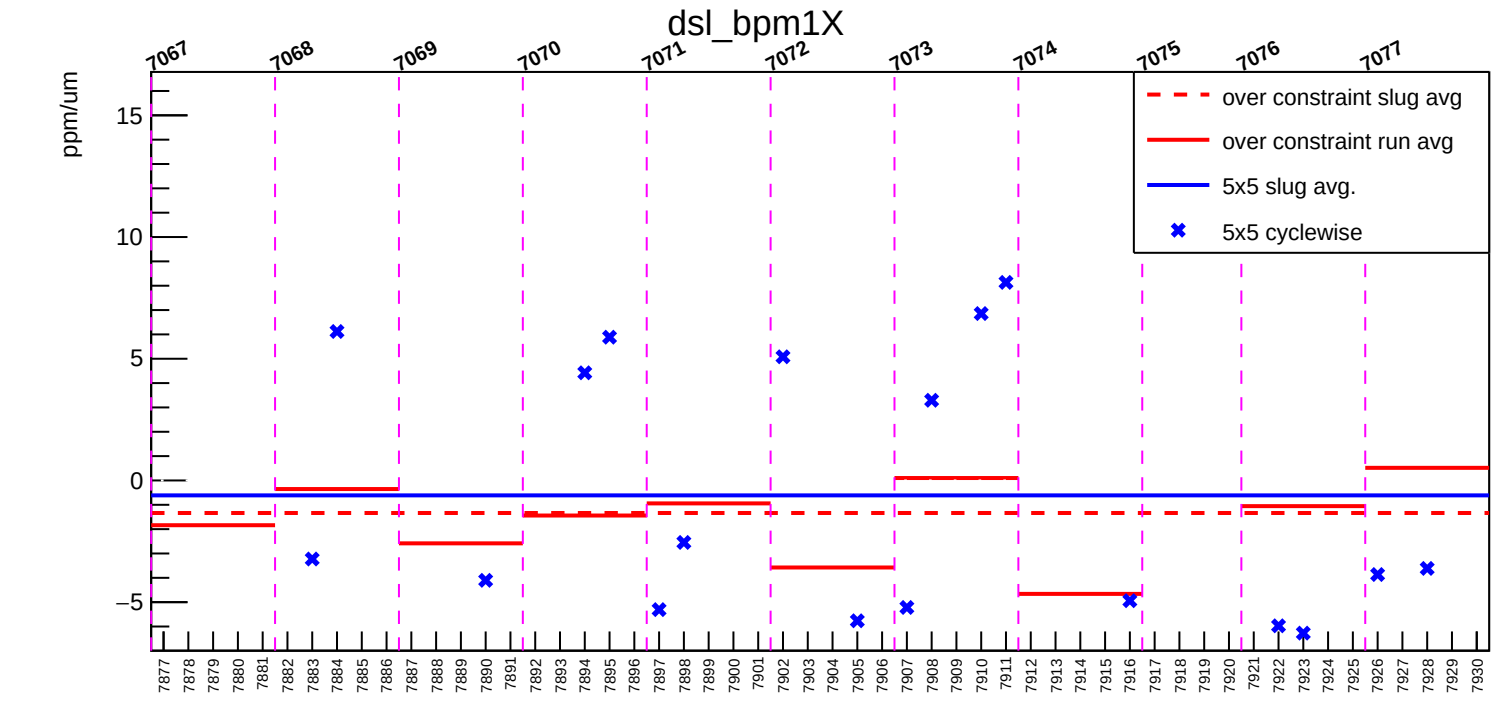
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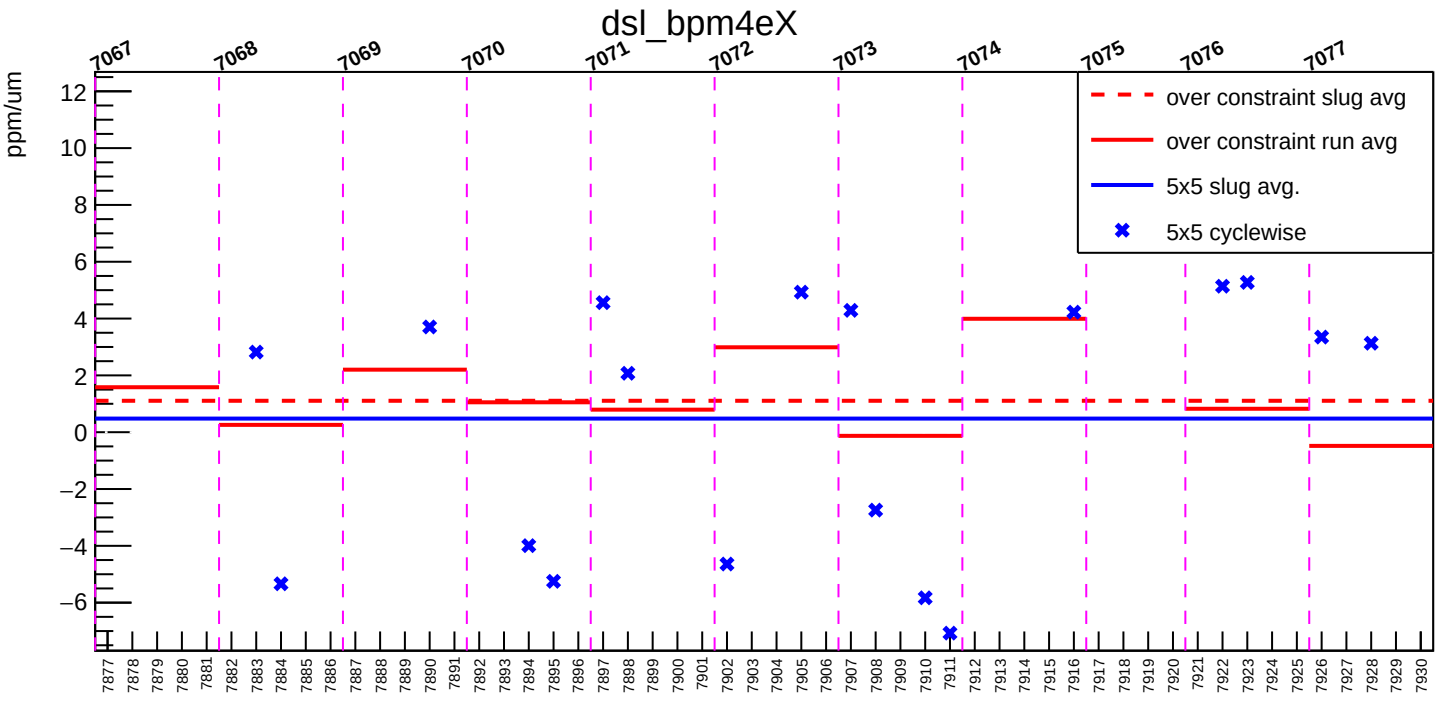
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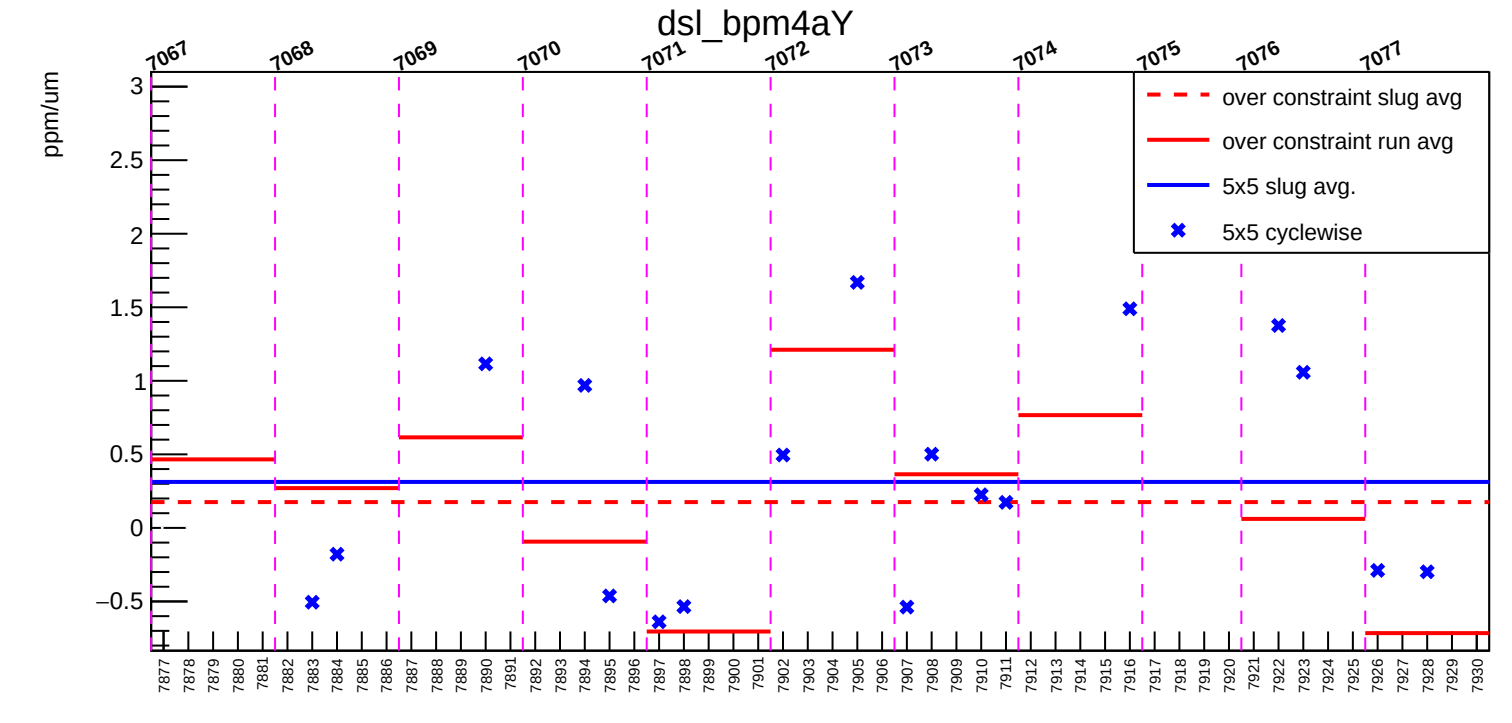
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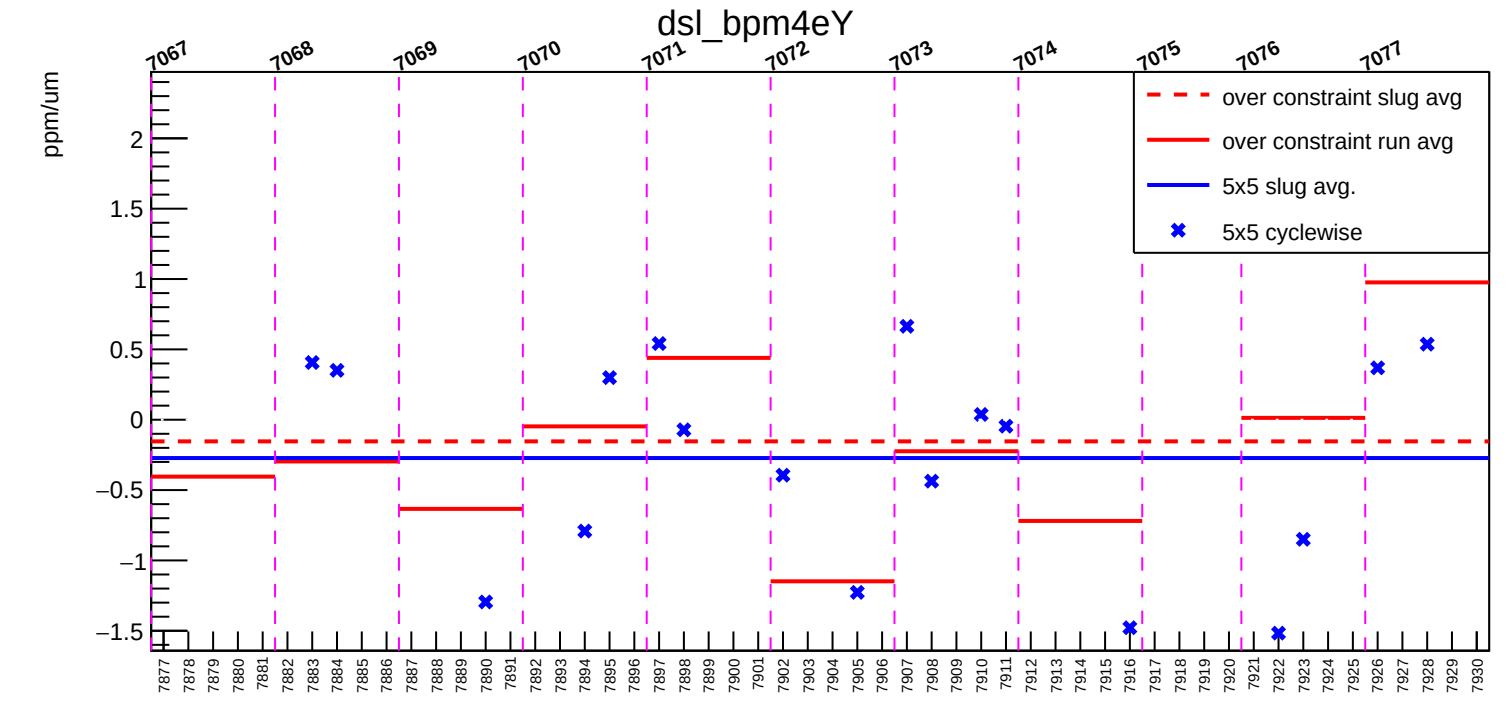
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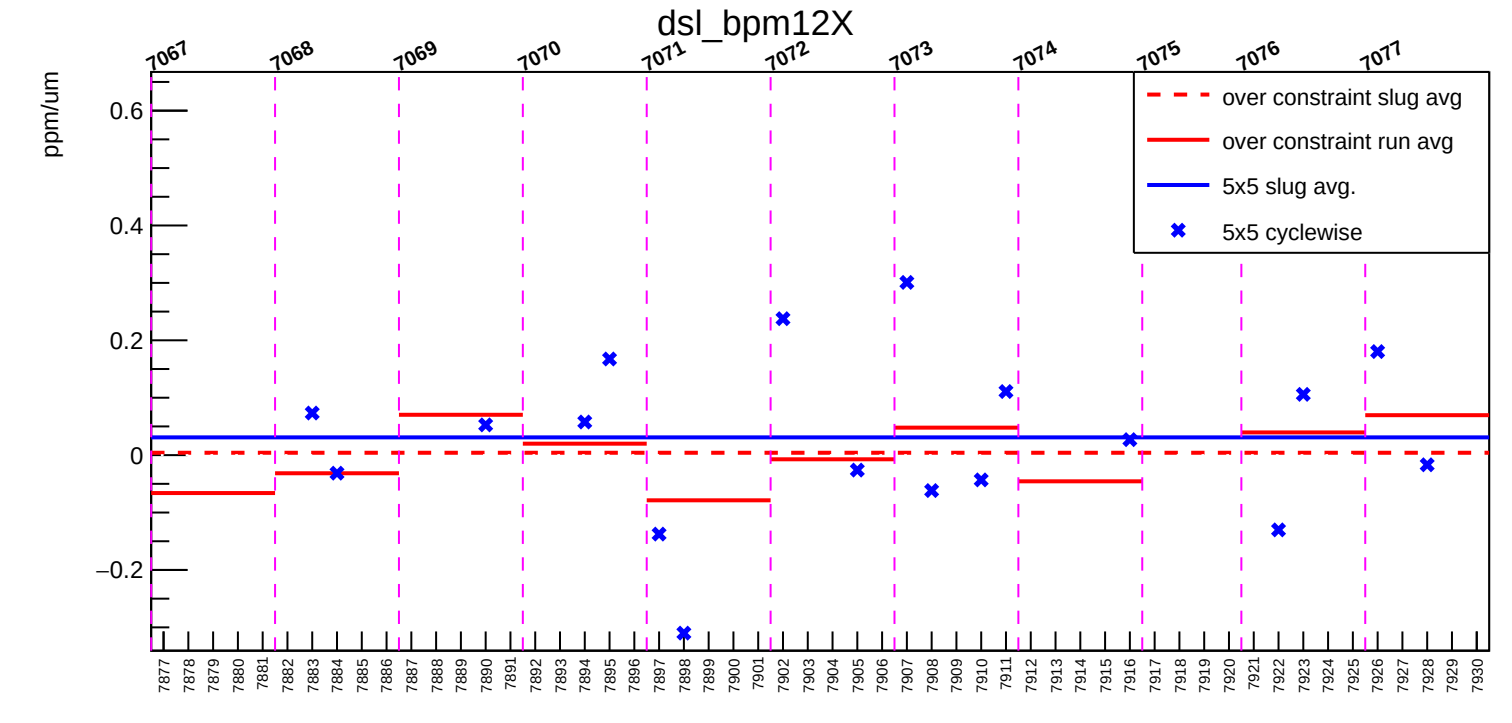
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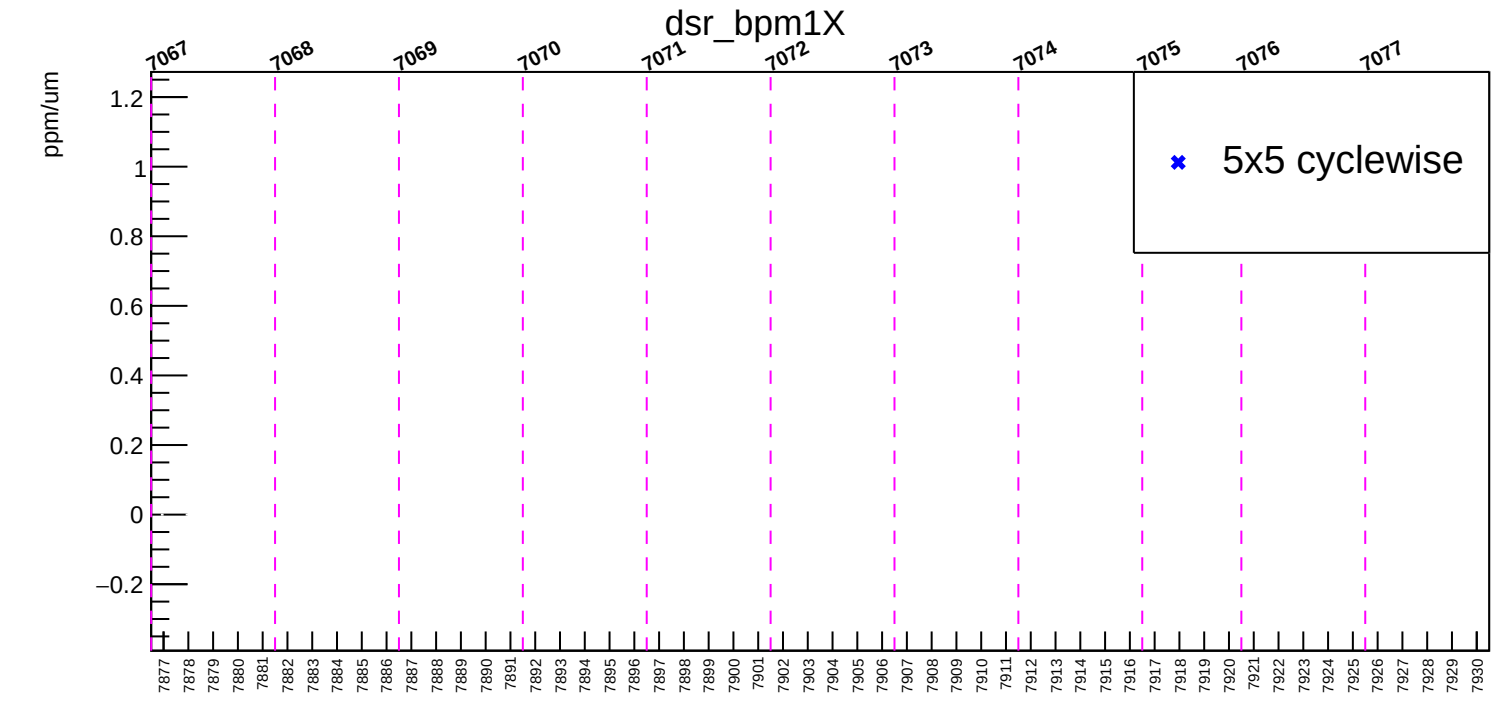
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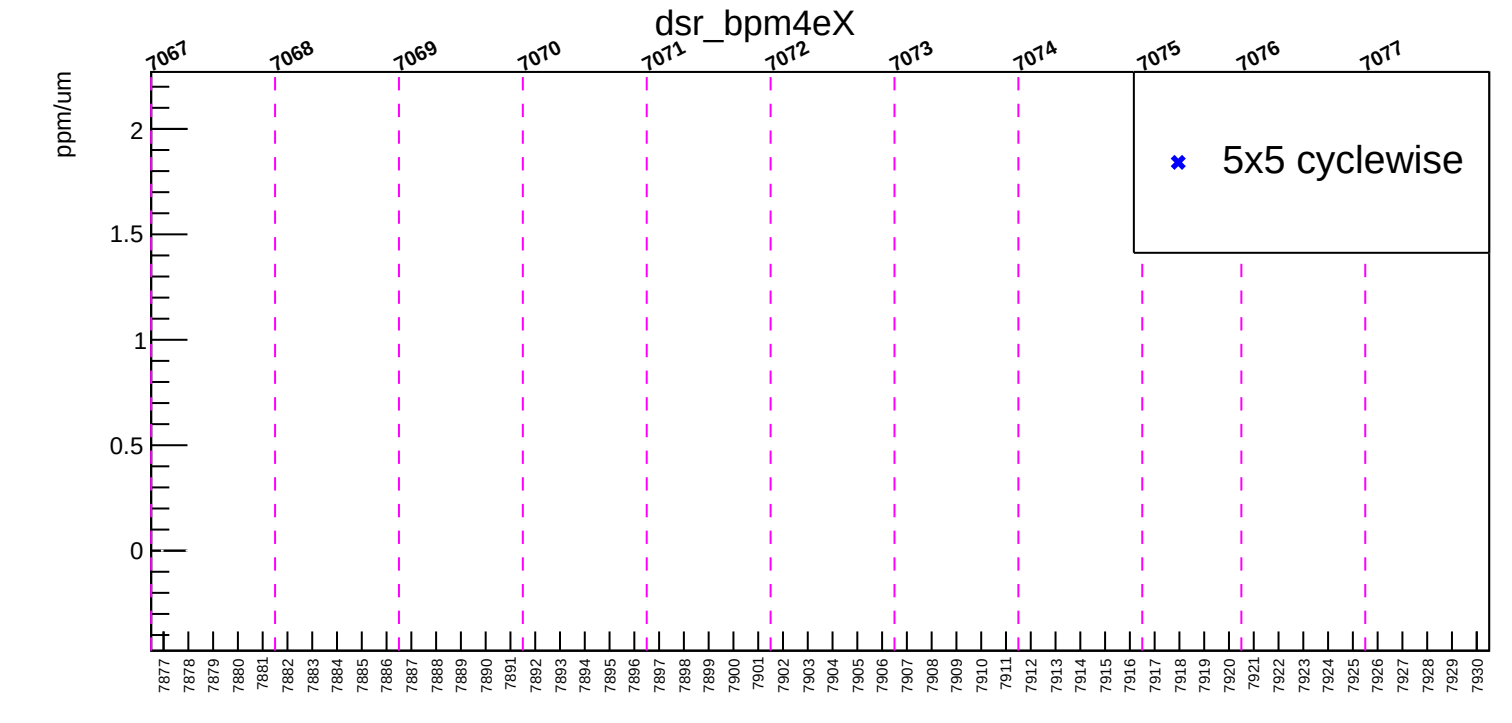
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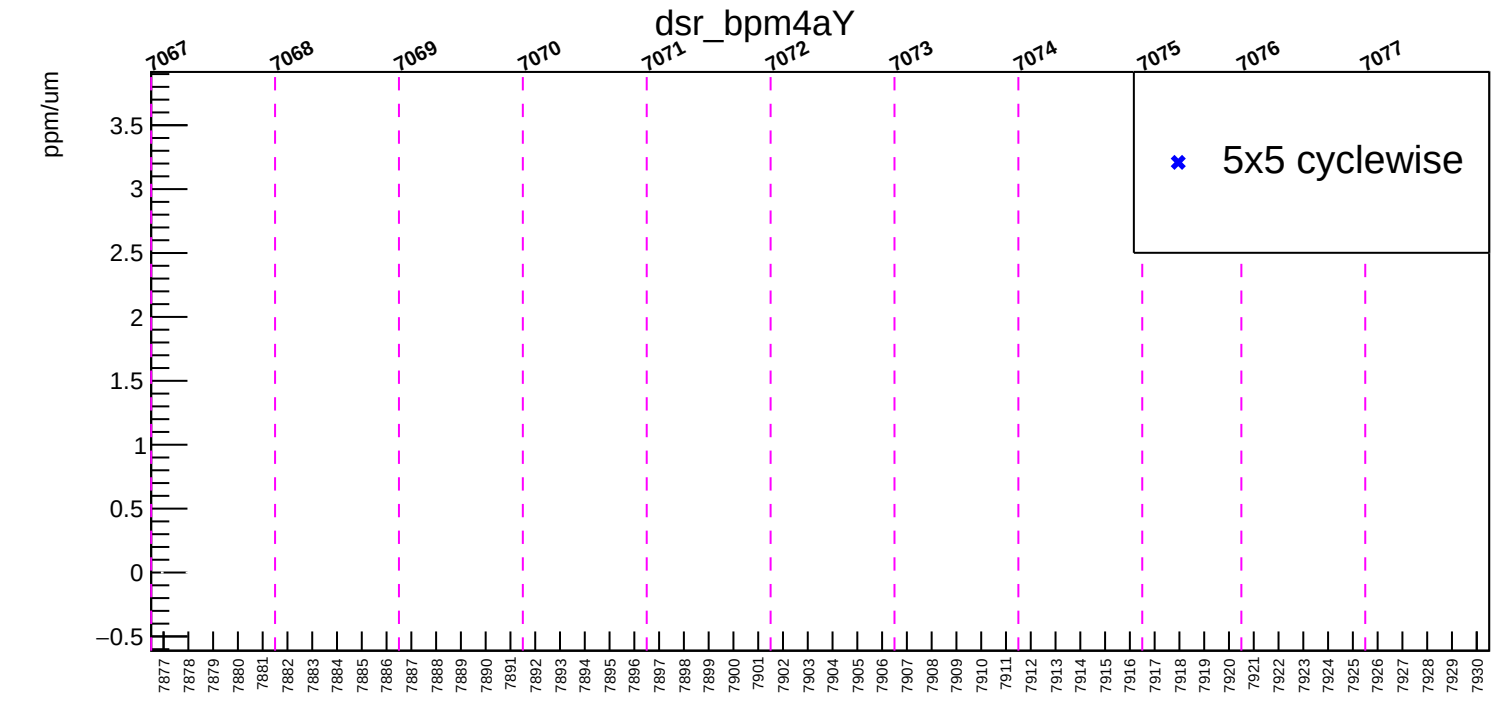
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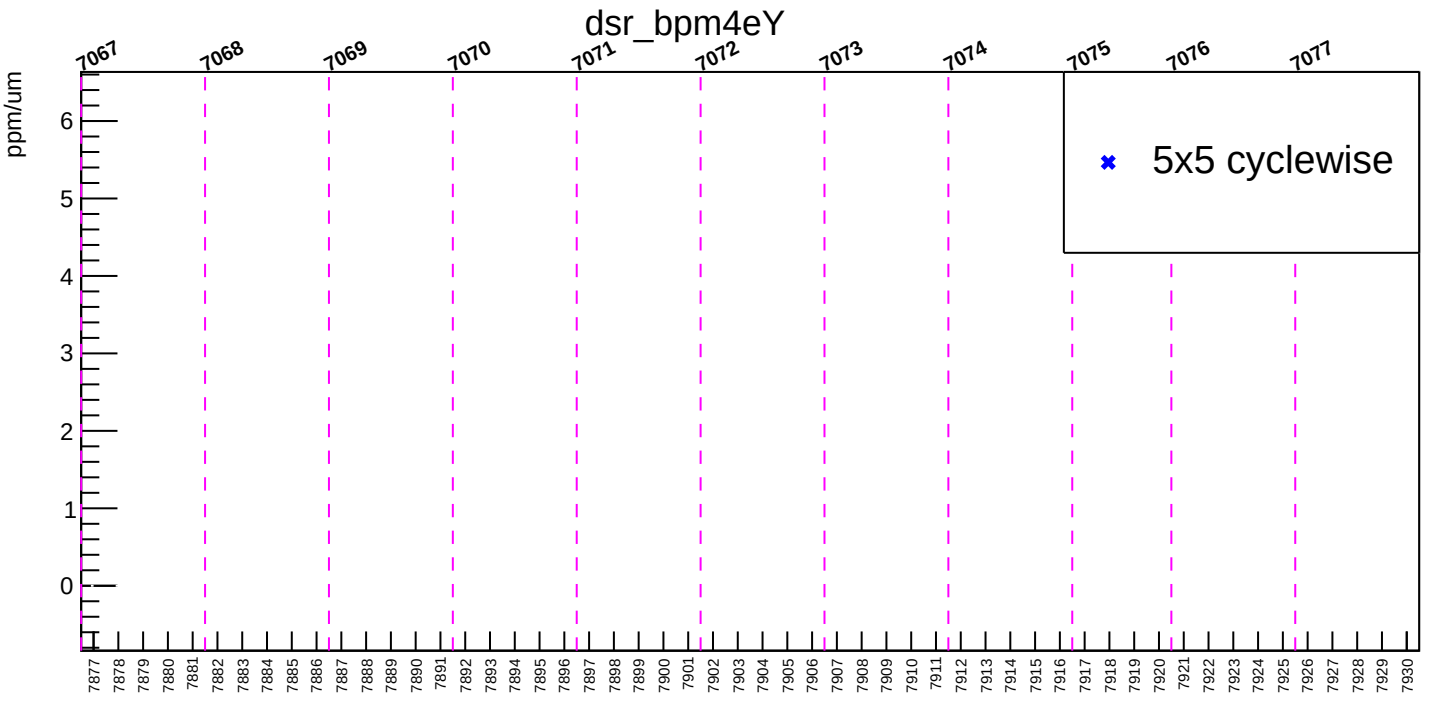
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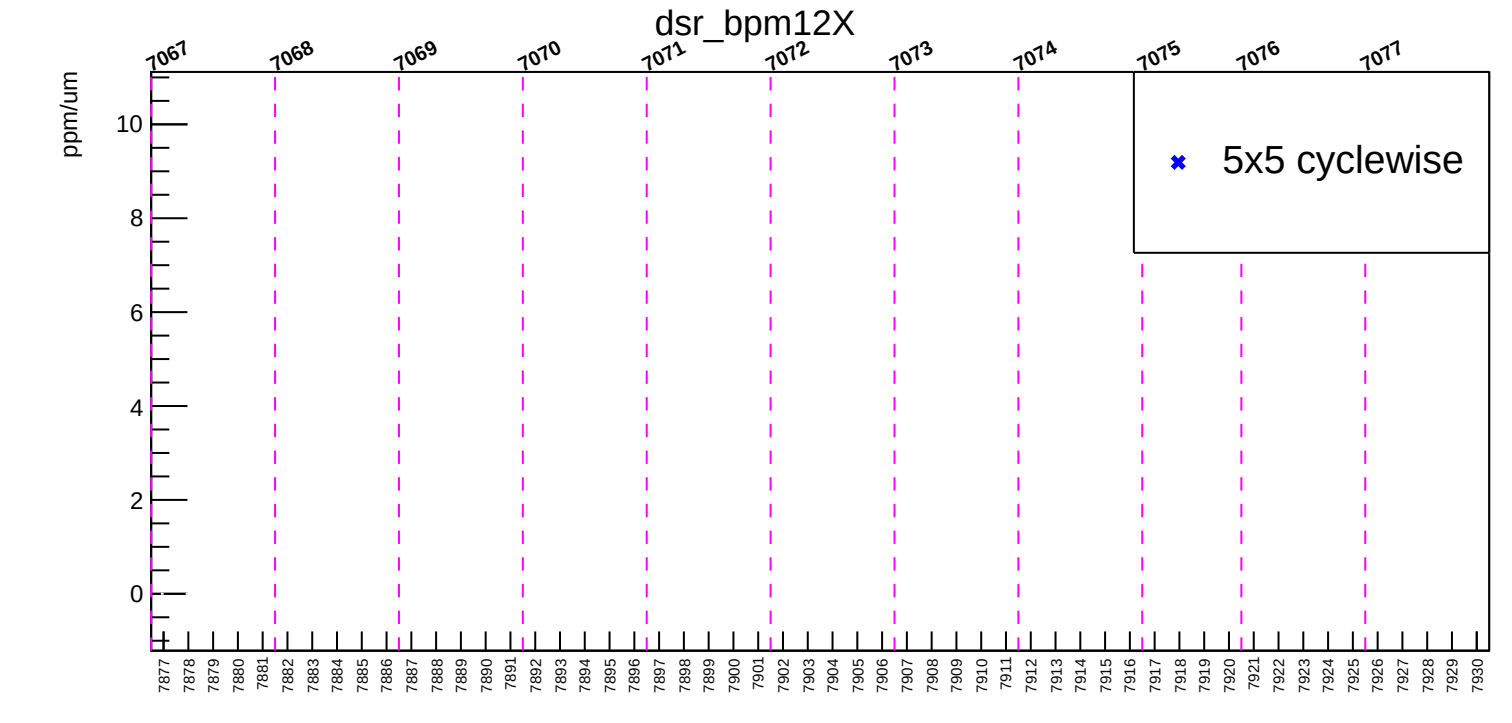
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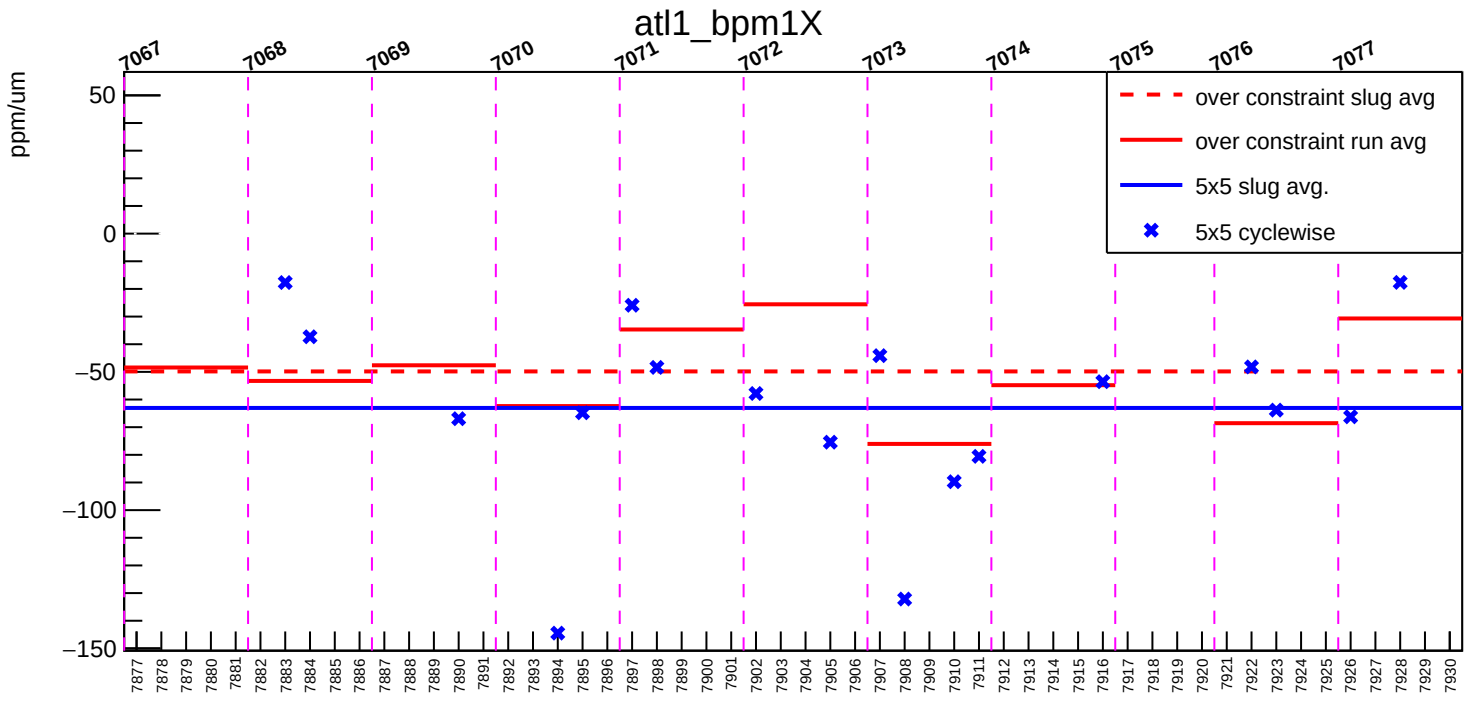
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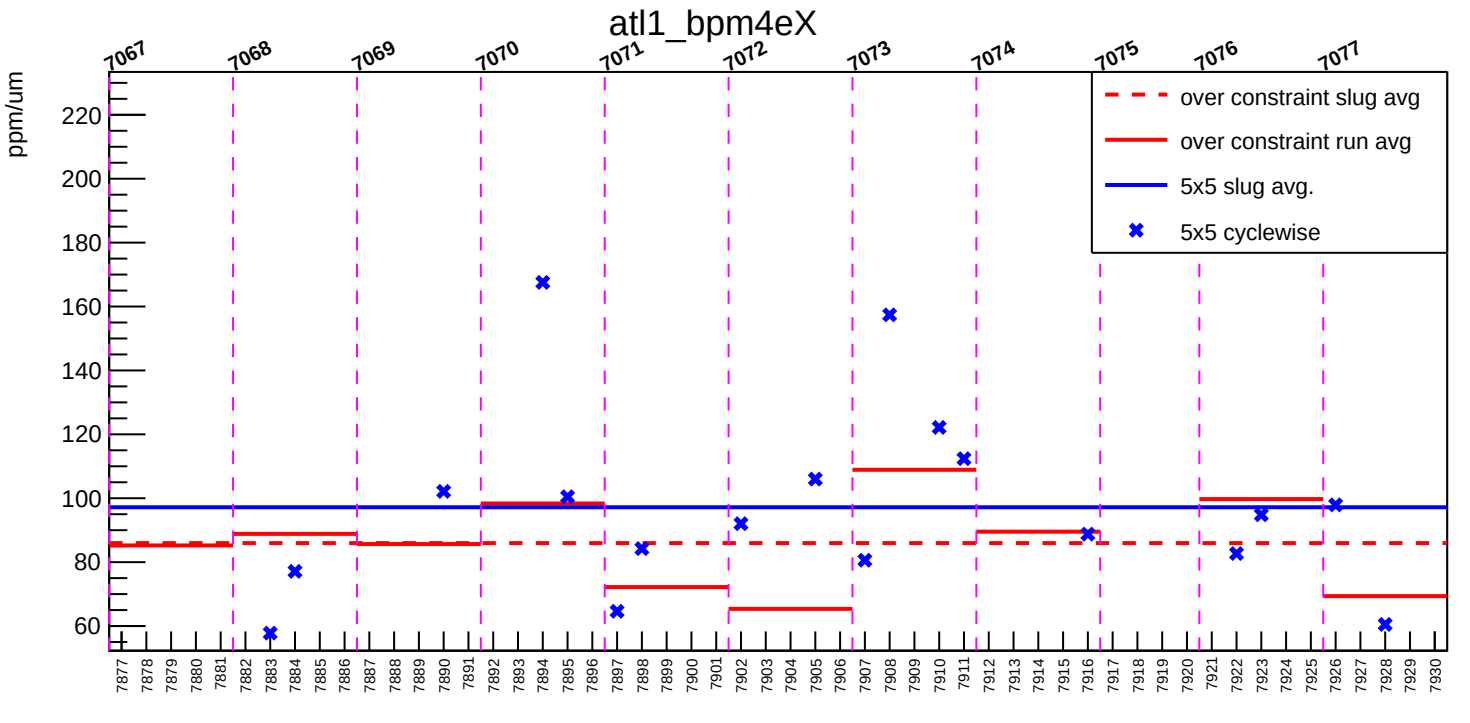
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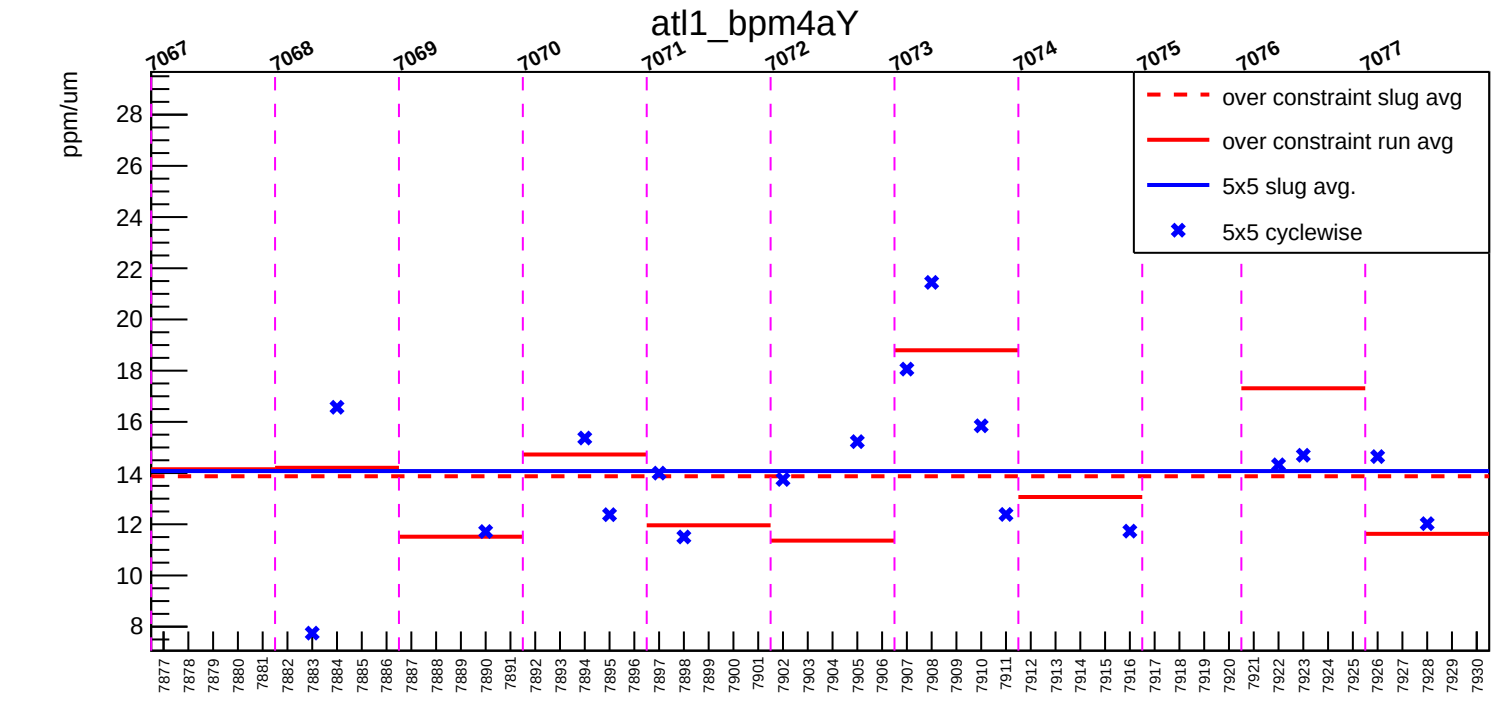
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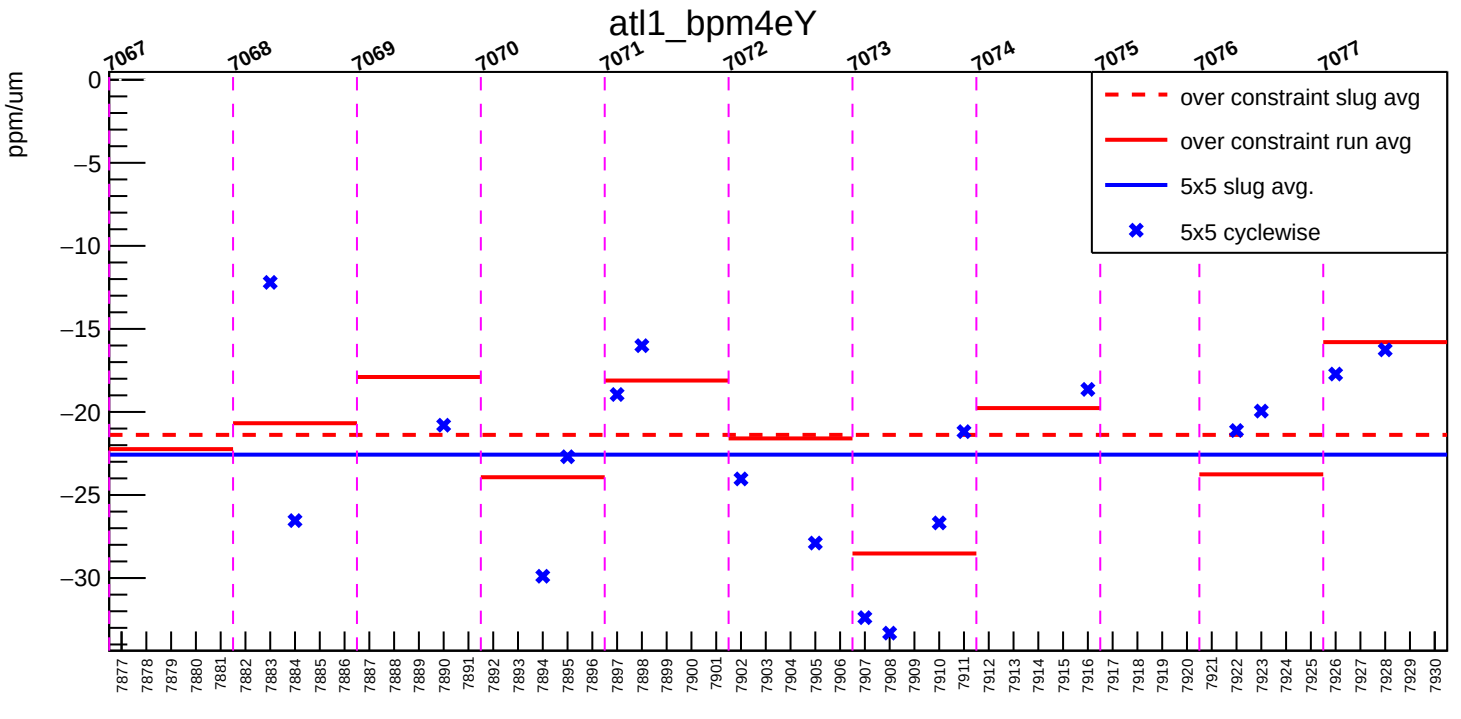
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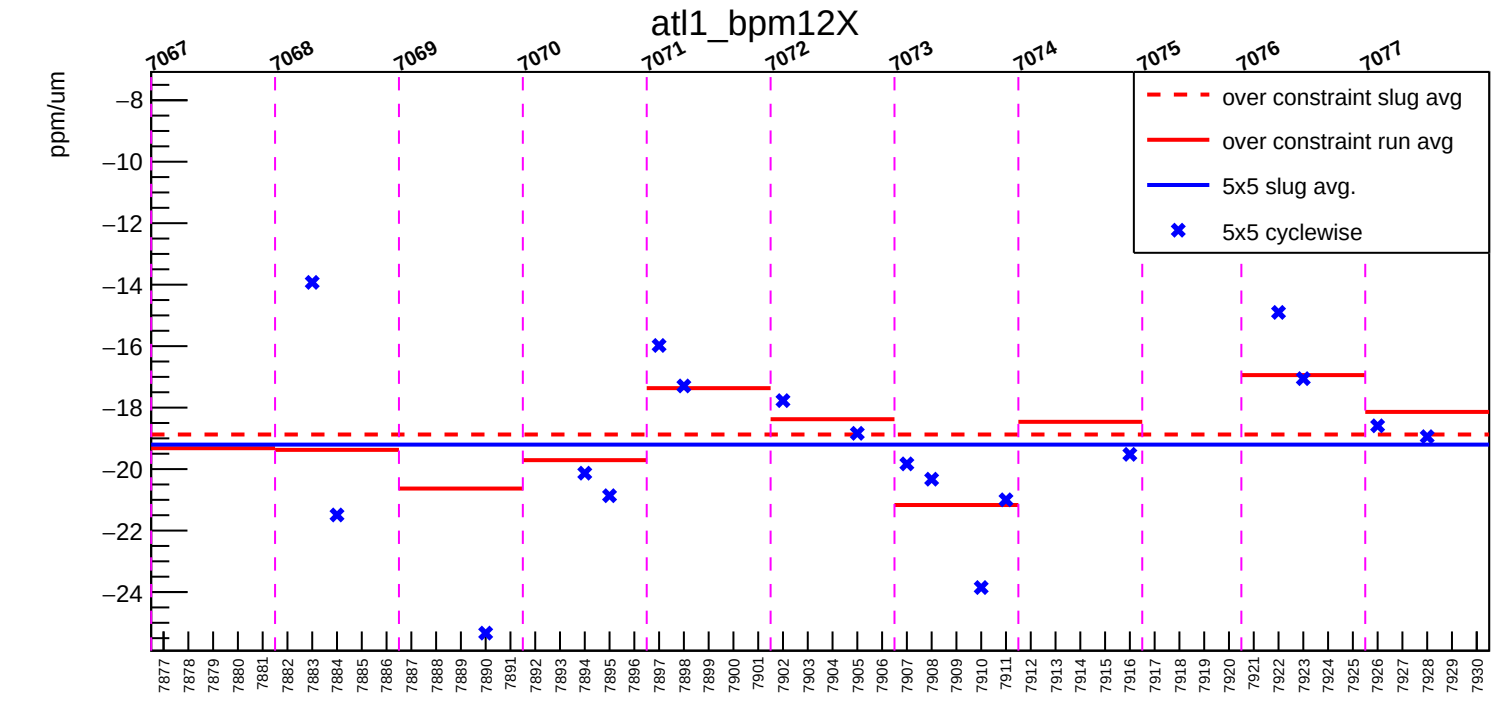
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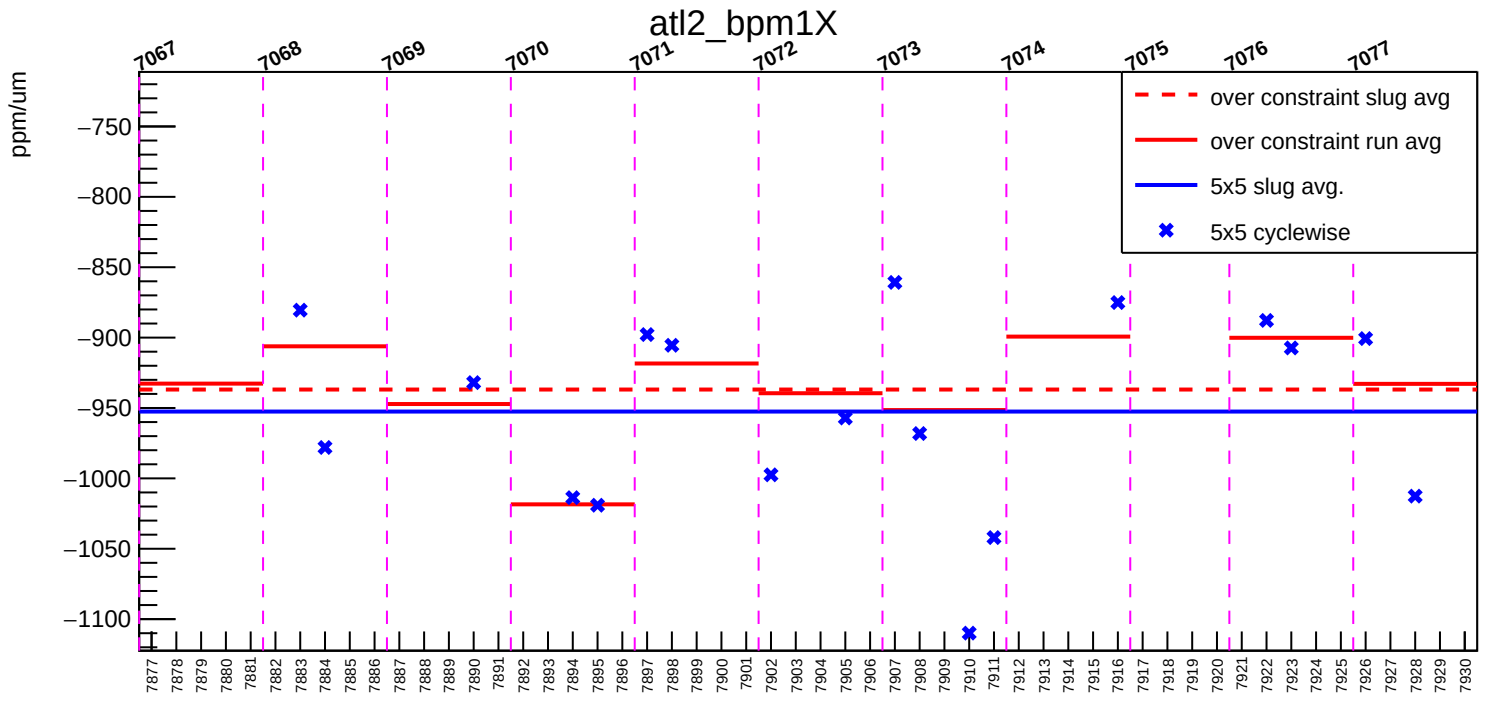
5x5 slug avg.
5x5 cyclewise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7070
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7076
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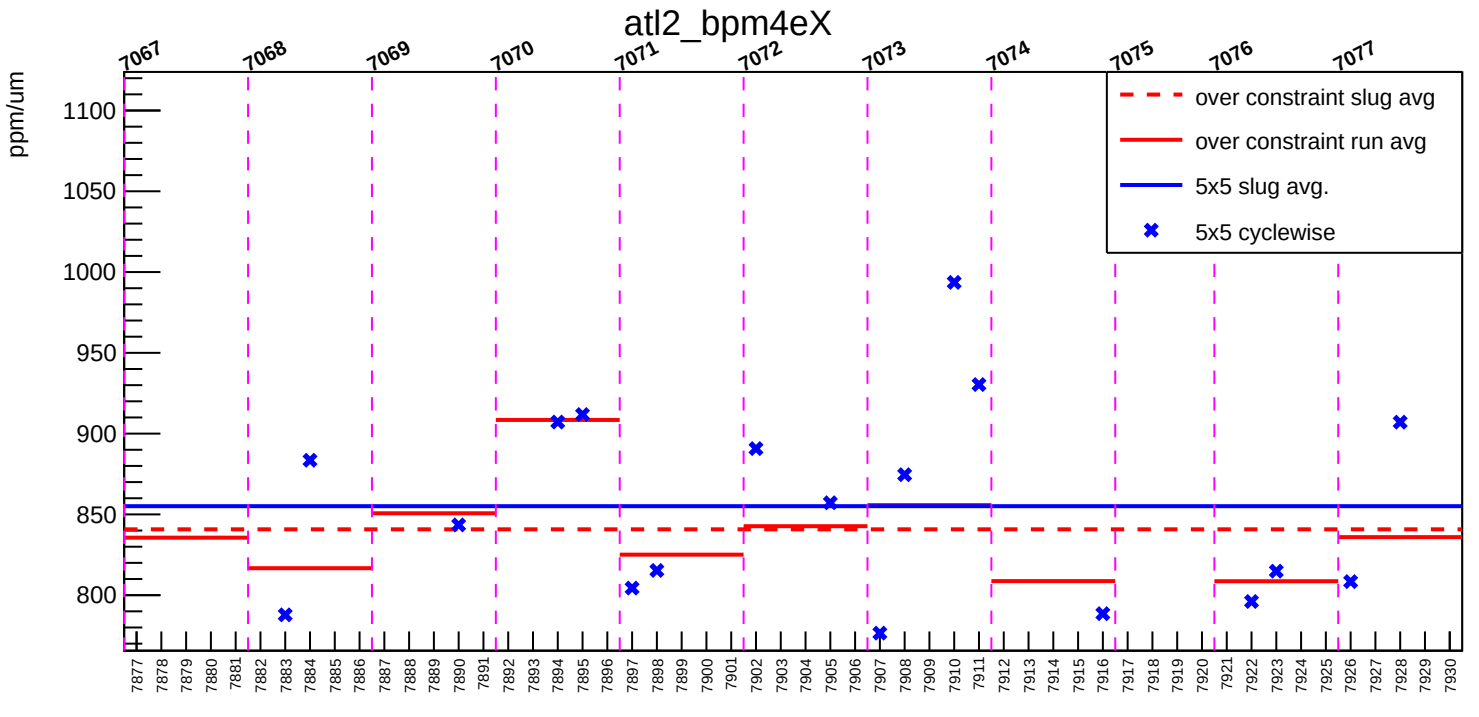
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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1050
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950
900
850
800
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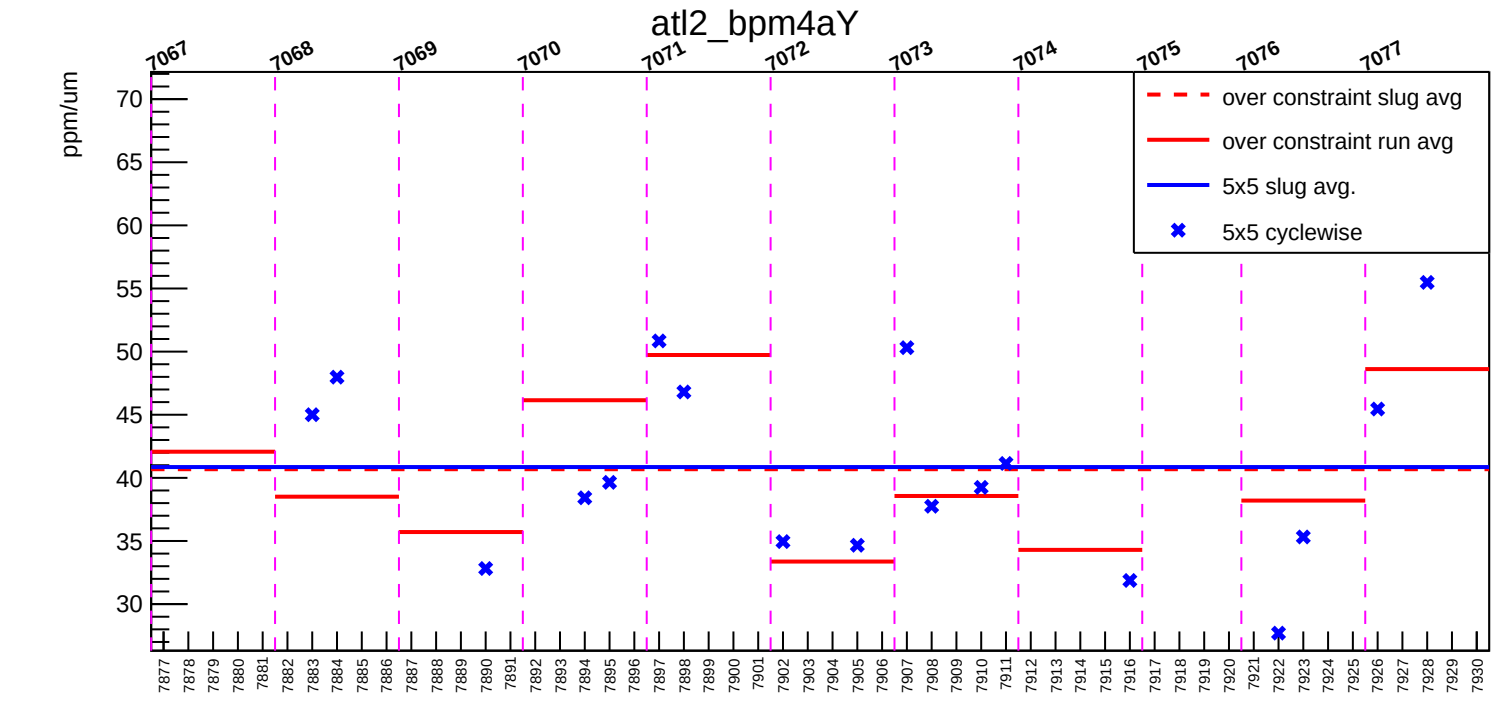
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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over constraint run avg
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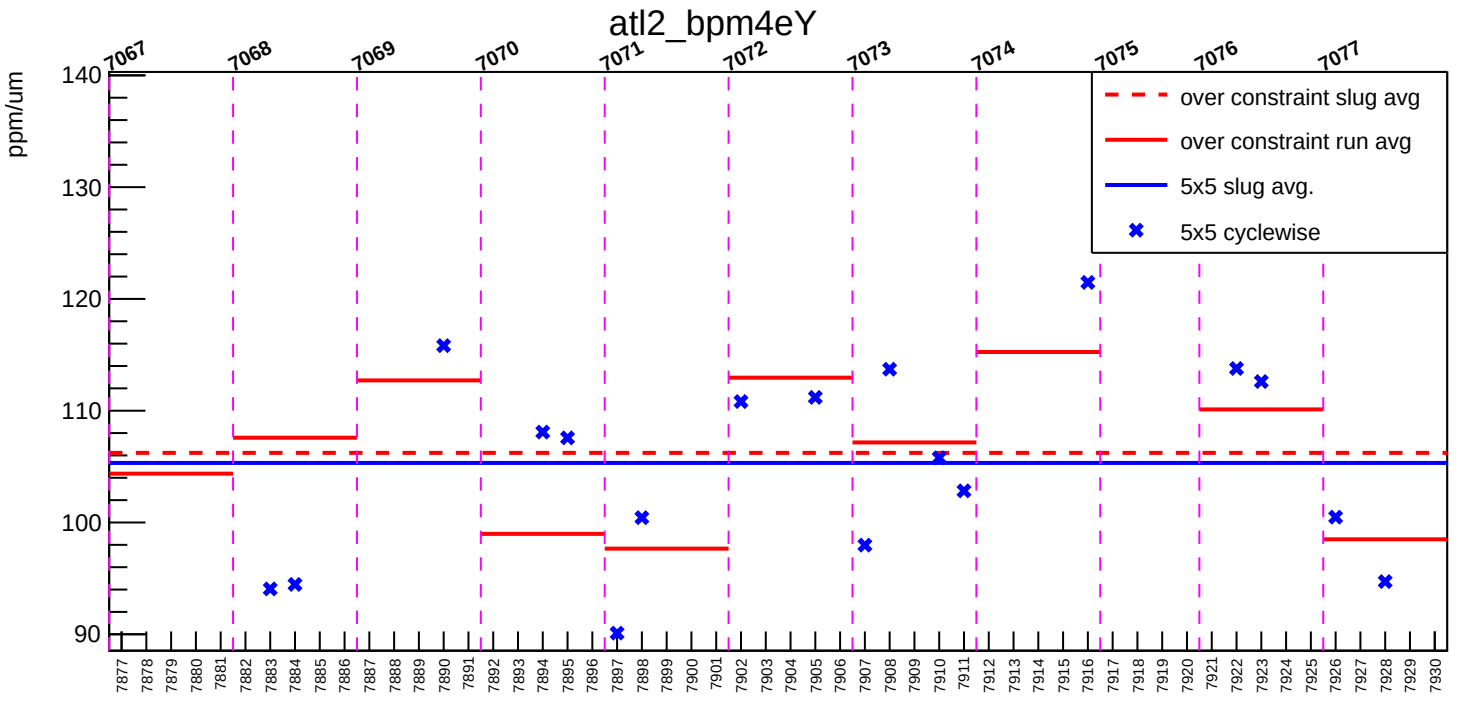
5x5 cyclewise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7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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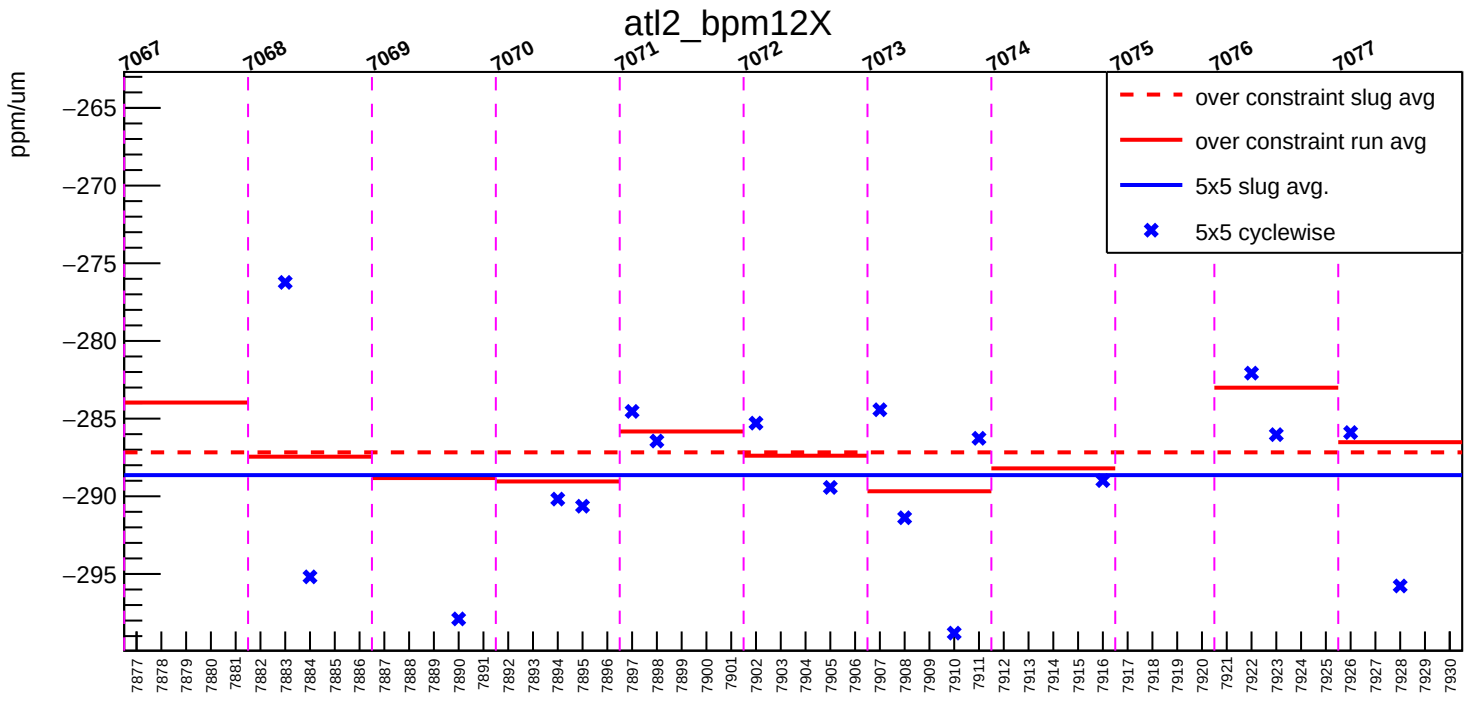
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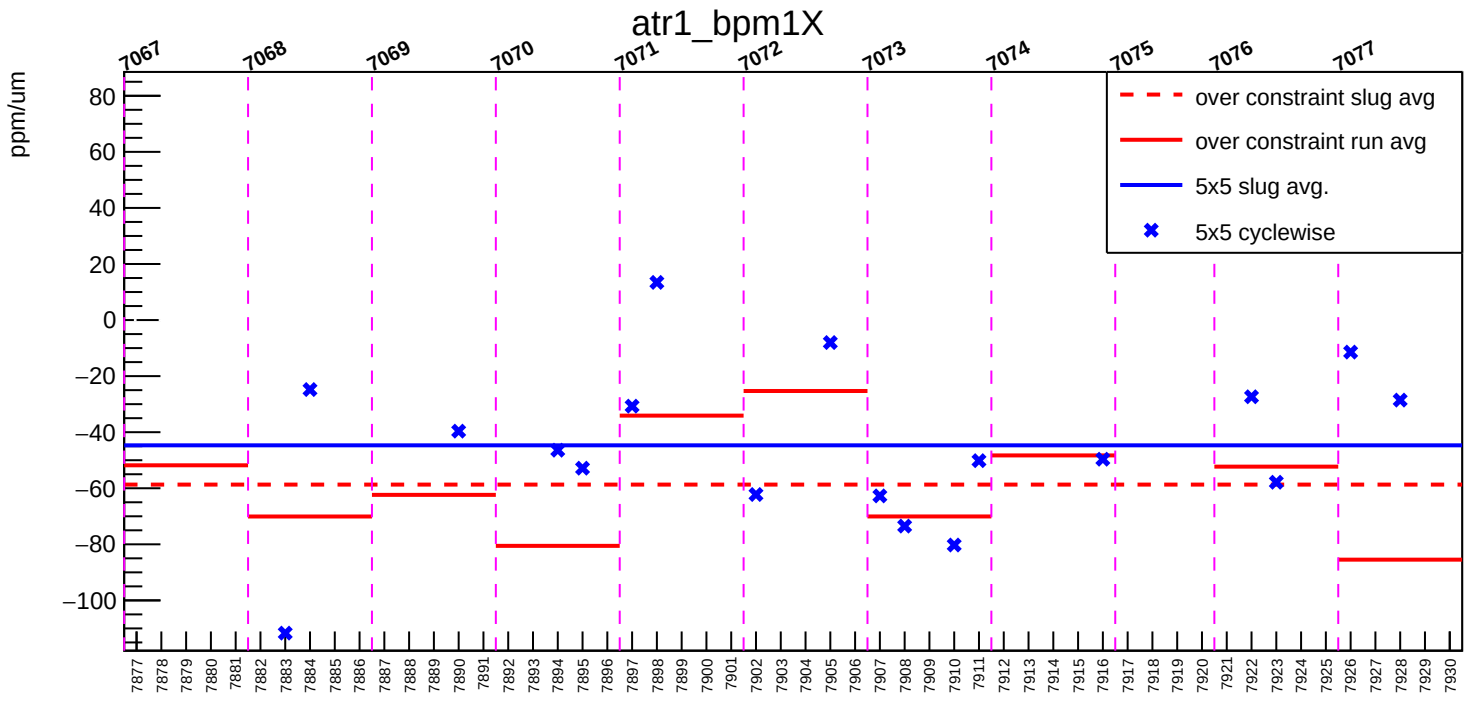
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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7077
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60
40
20
0
−20
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−60
−80
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over constraint run avg
5x5 slug avg.
5x5 cyclewise
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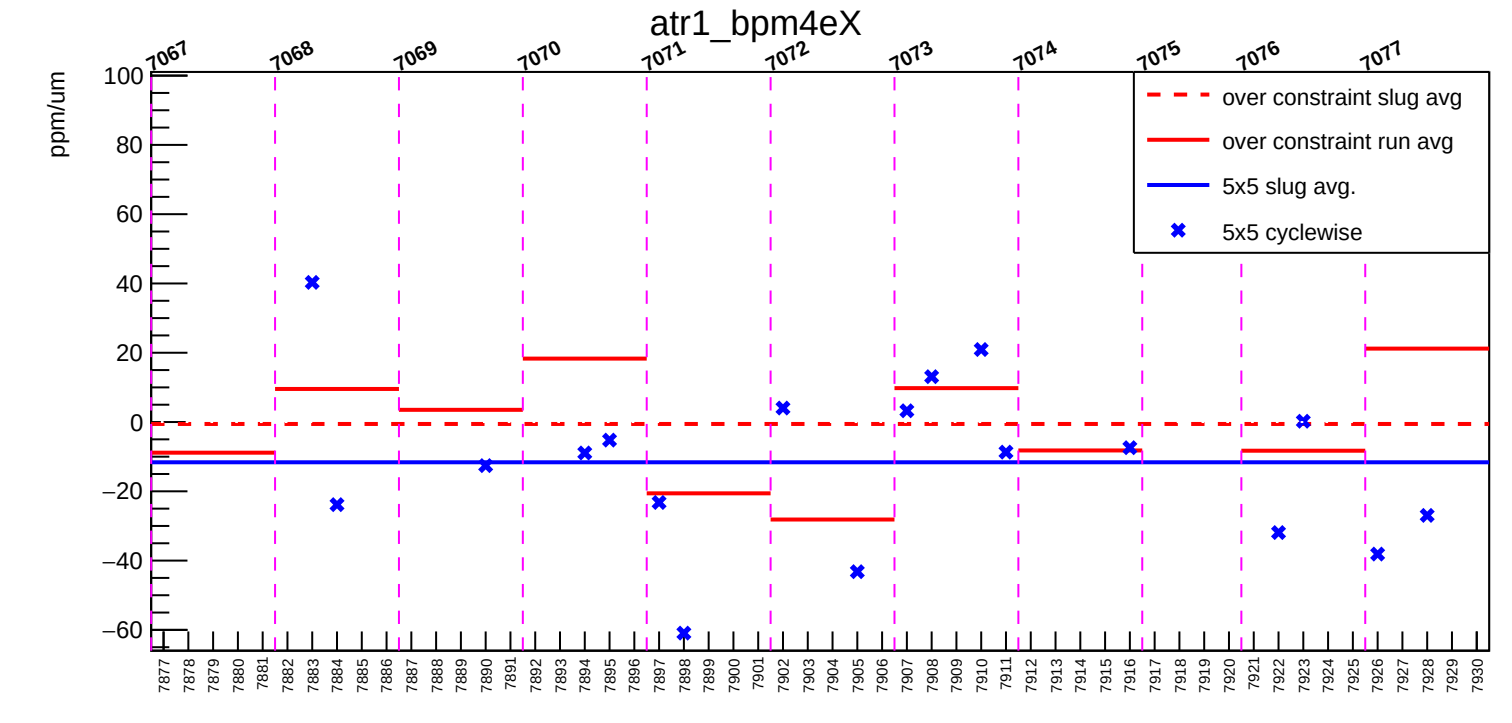
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7071
7072
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7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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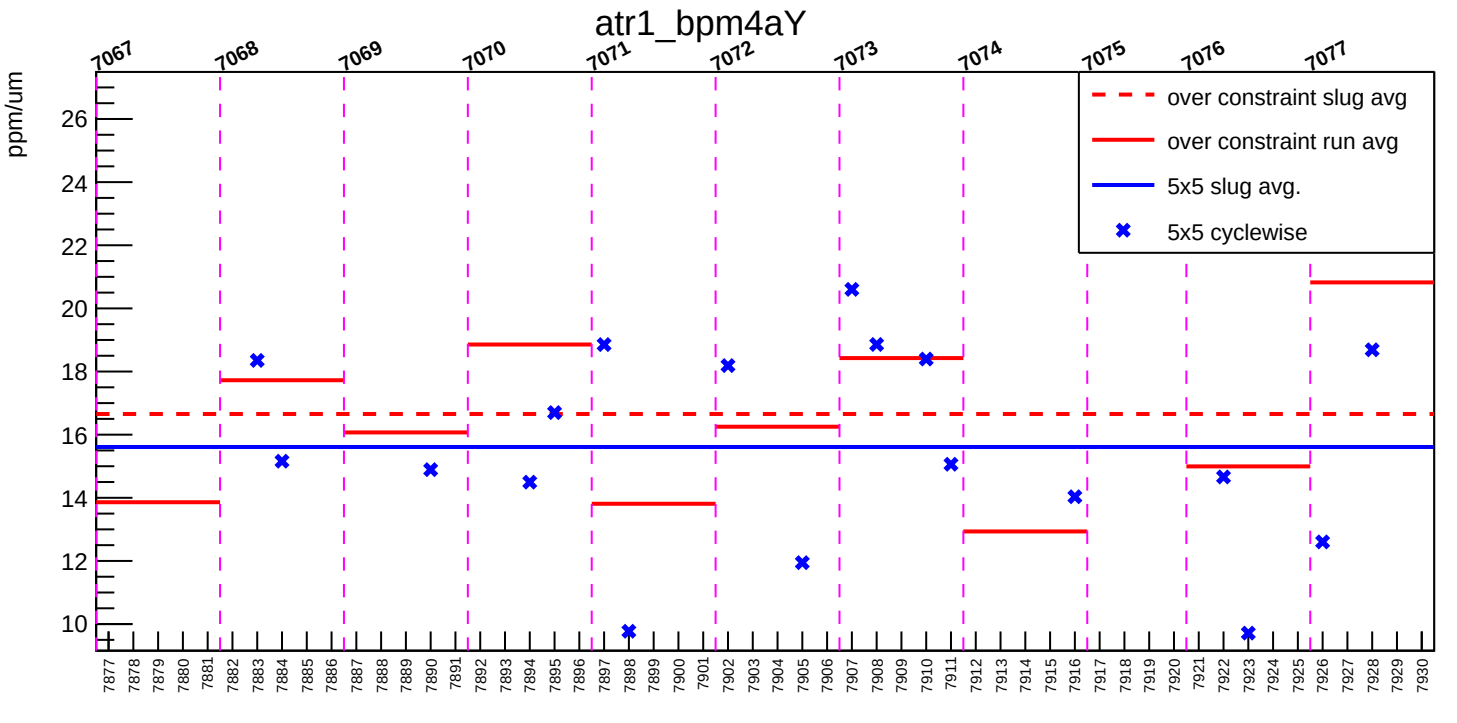
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7076
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18
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over constraint run avg
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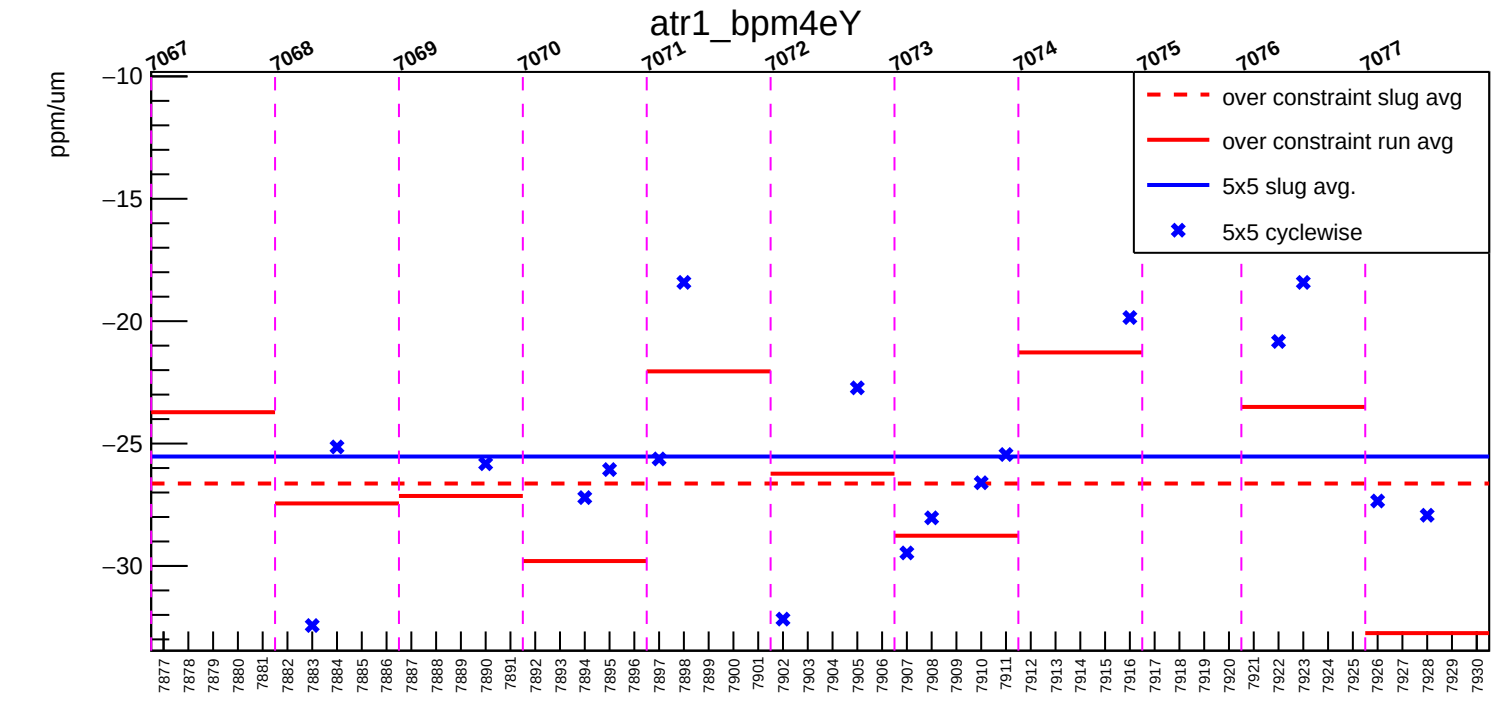
5x5 cyclewise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7074
7075
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7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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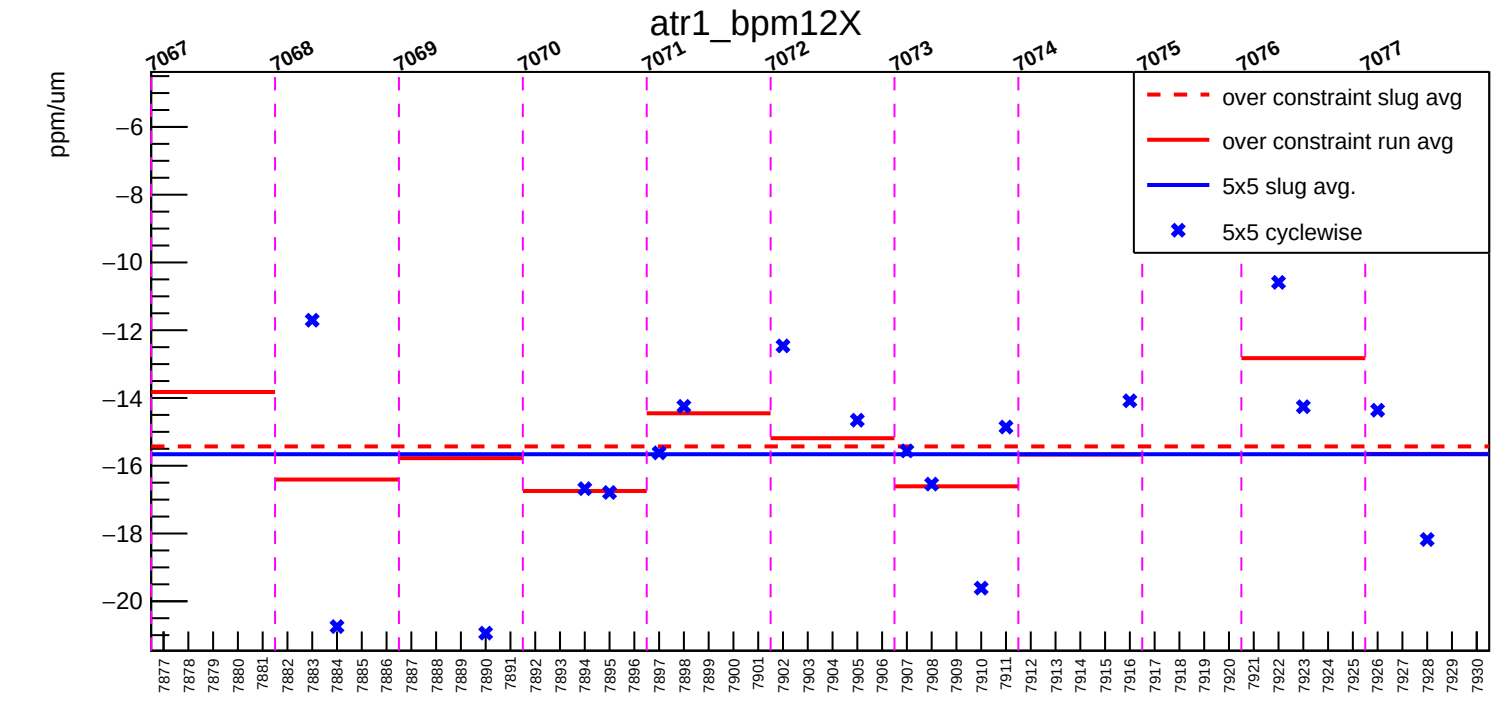
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7077
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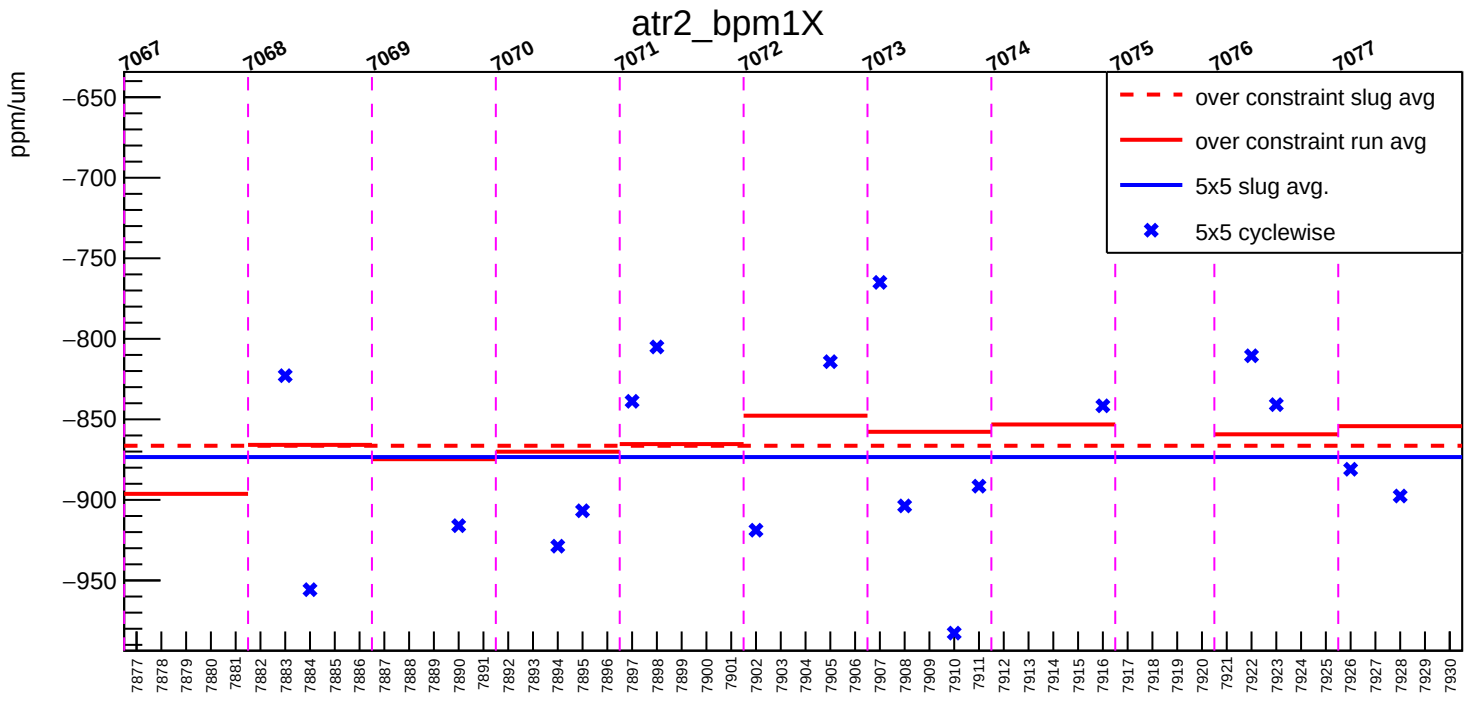
over constraint run avg
5x5 slug avg.
5x5 cyclewise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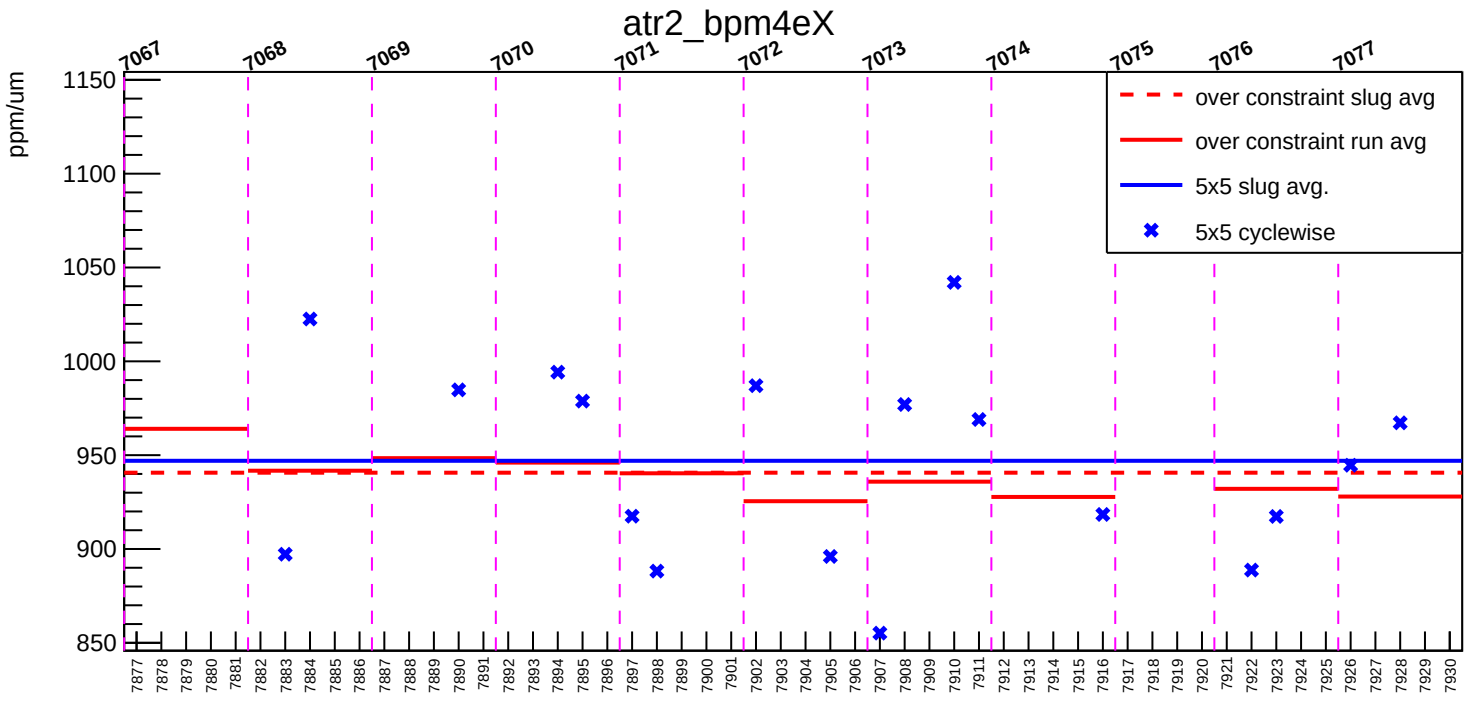
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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1050
1000
950
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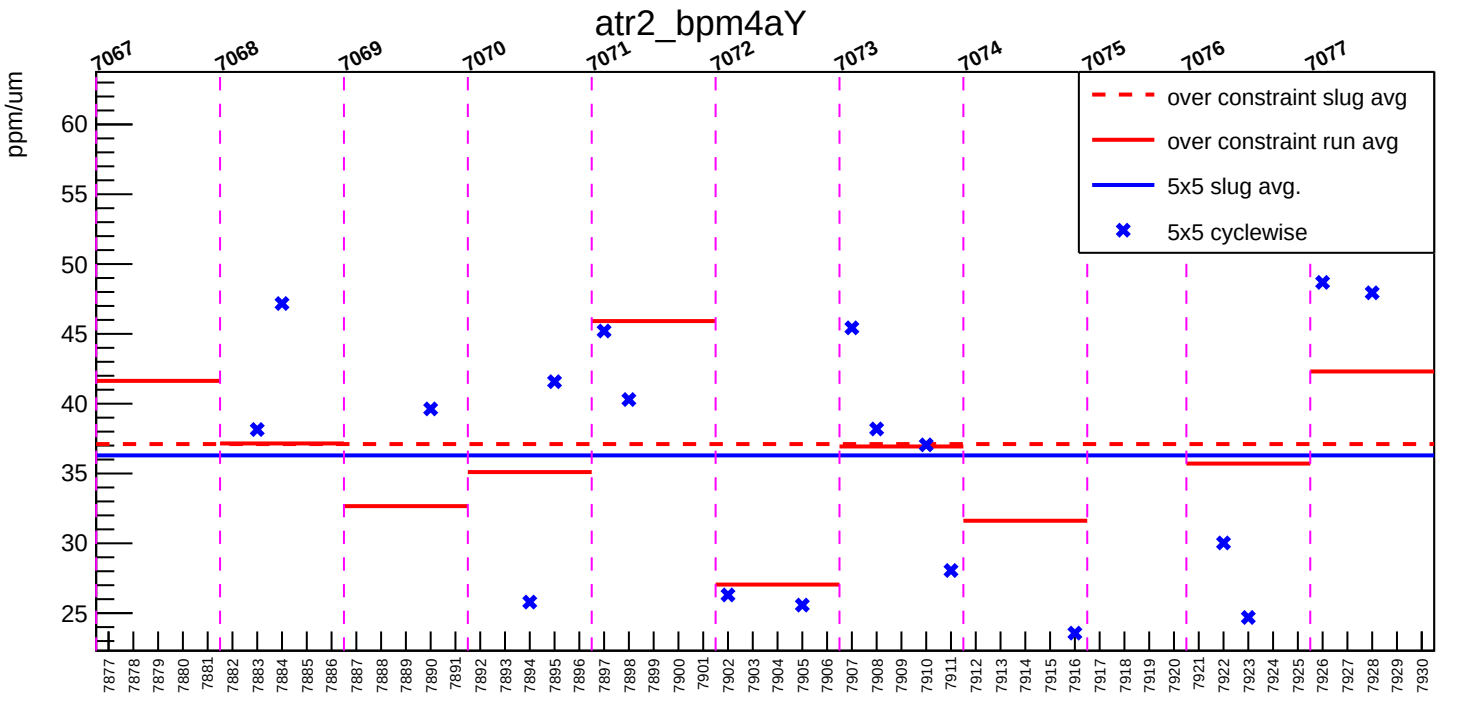
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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7075
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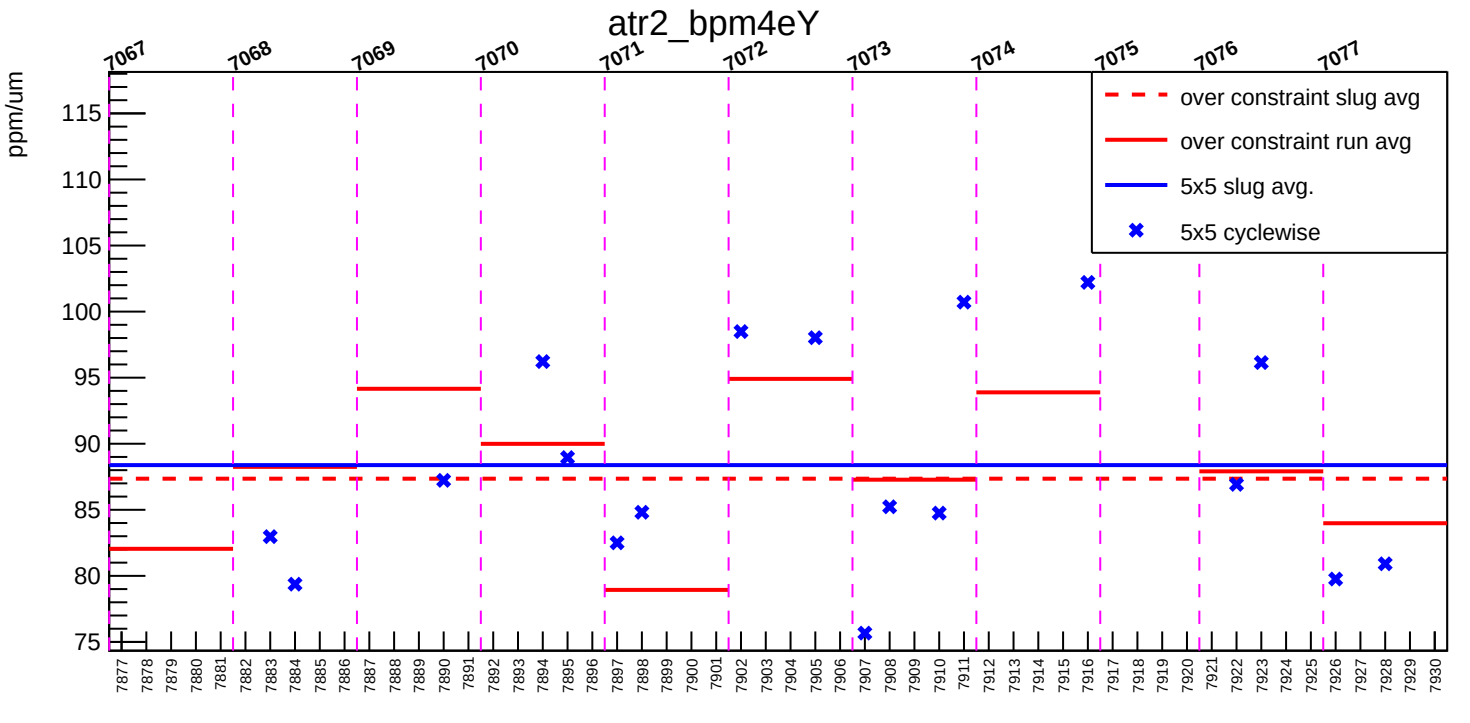
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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7075
7076
7077
115
110
105
100
95
90
85
80
75
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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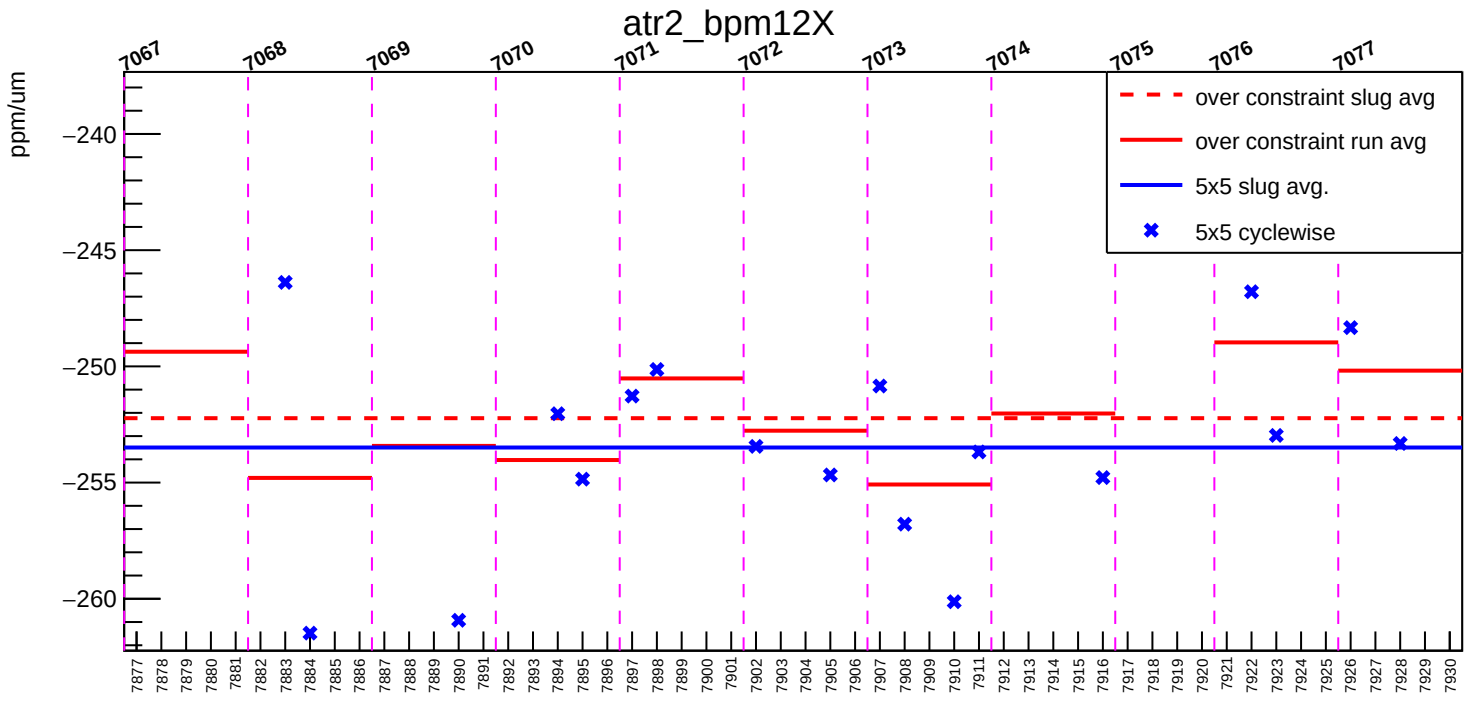
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7070
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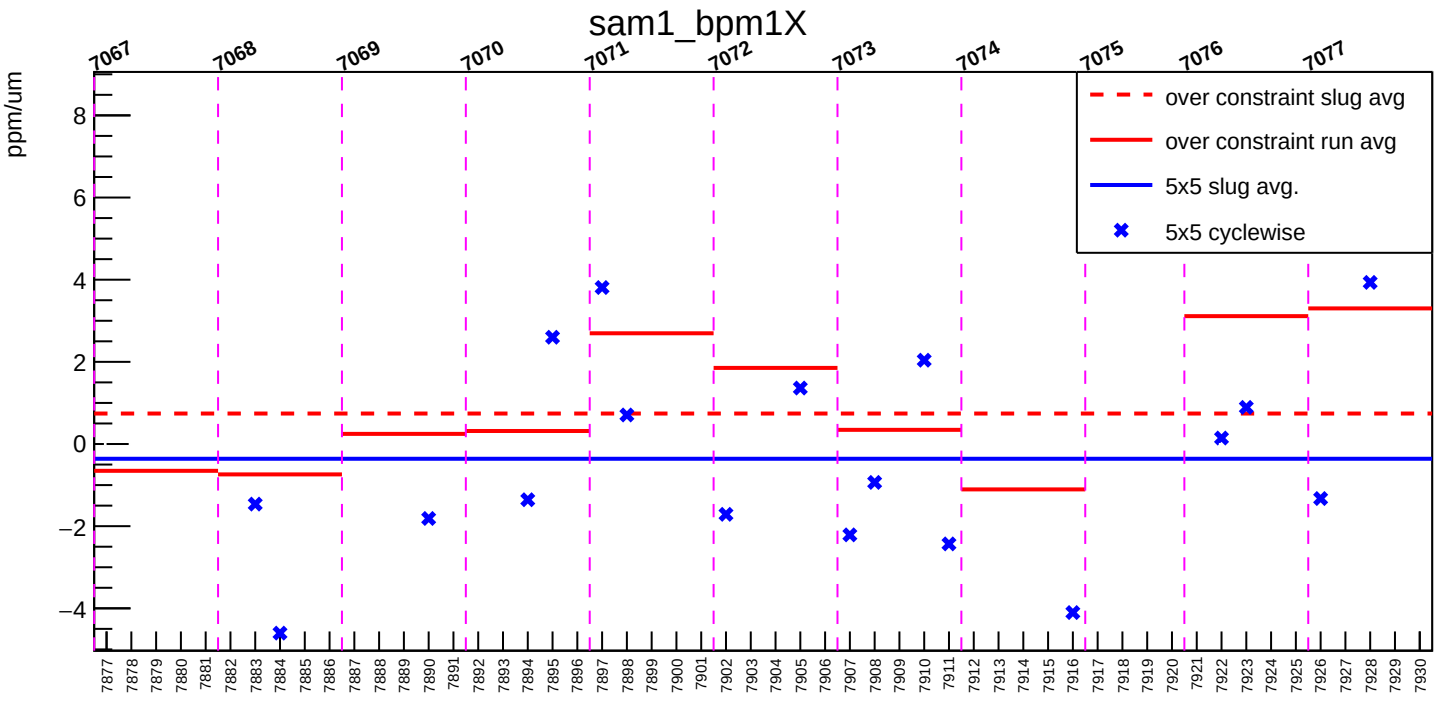
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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ppm/um
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7077
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4
2
0
−2
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over constraint run avg
5x5 slug avg.
5x5 cyclewise
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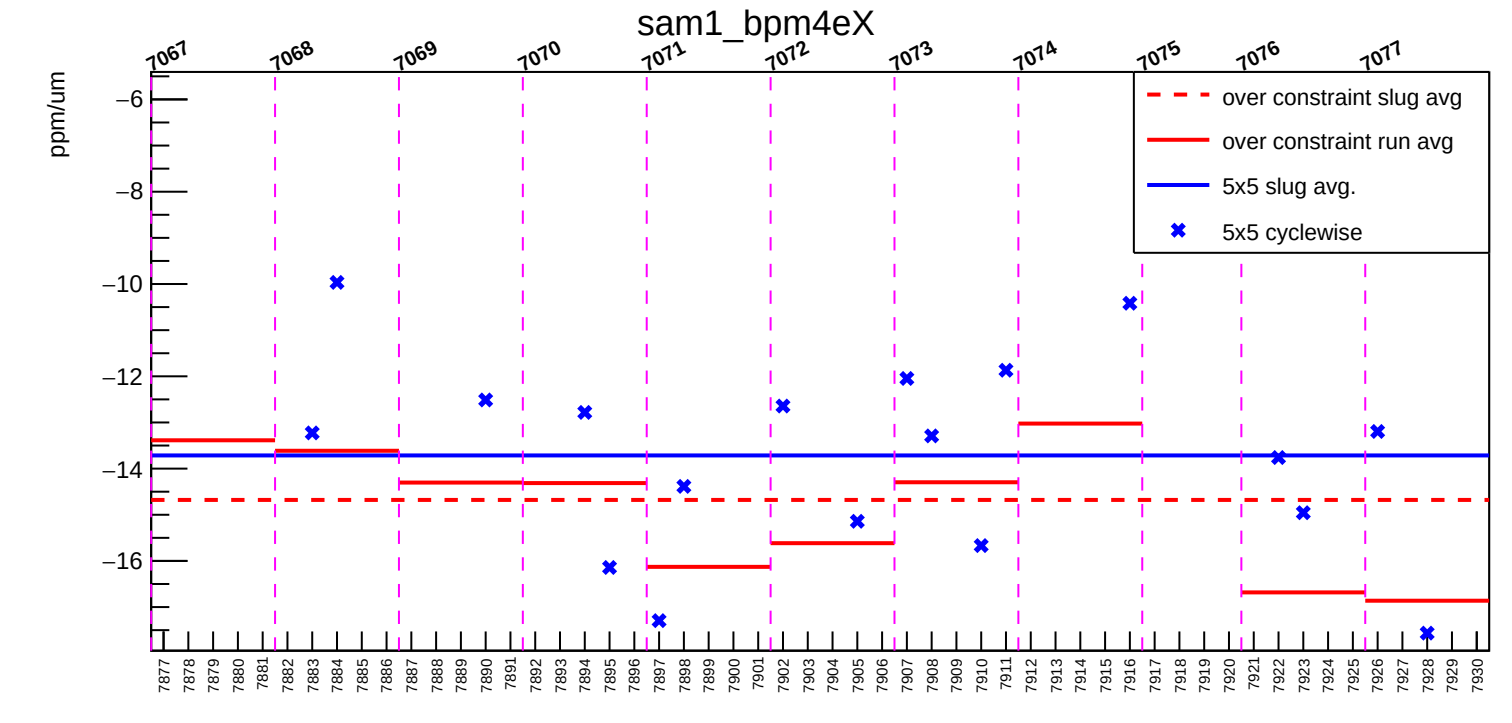
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ppm/um
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7068
7069
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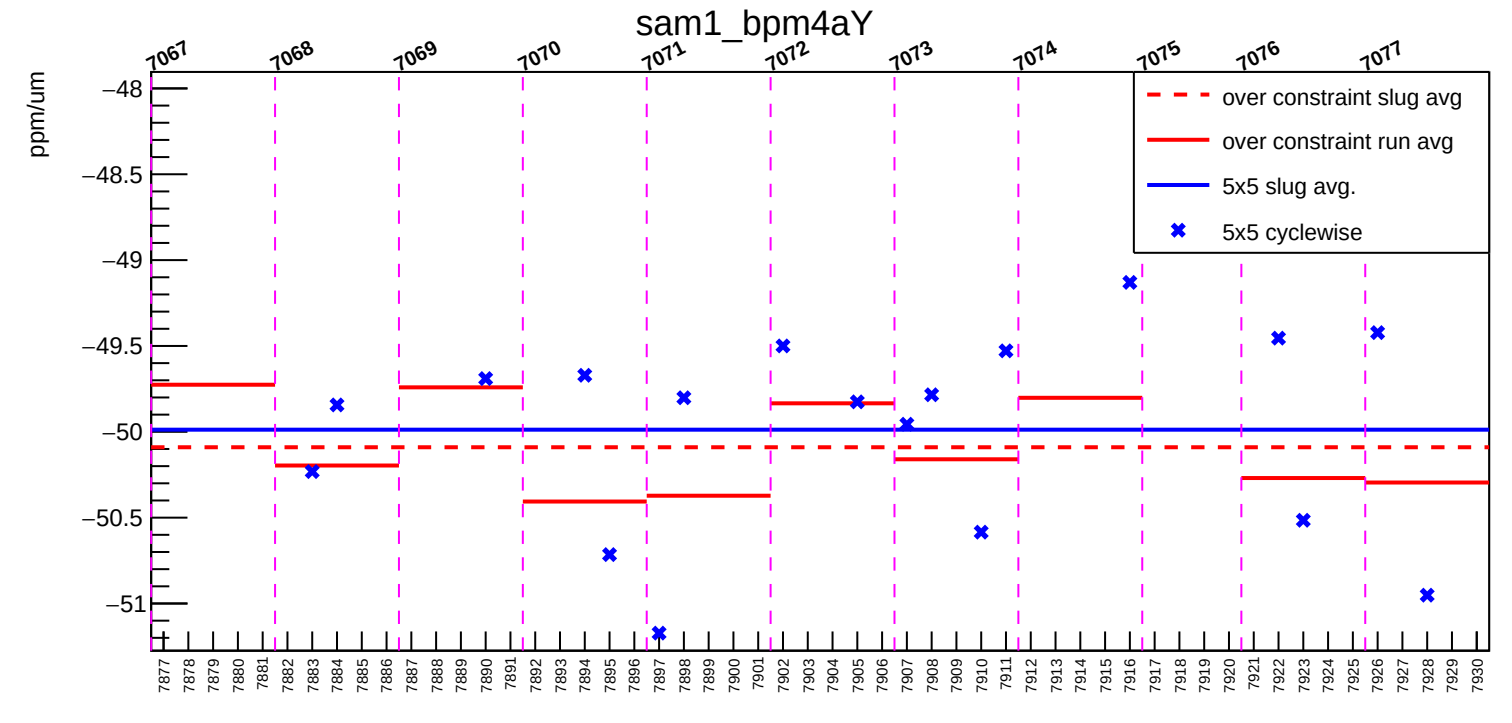
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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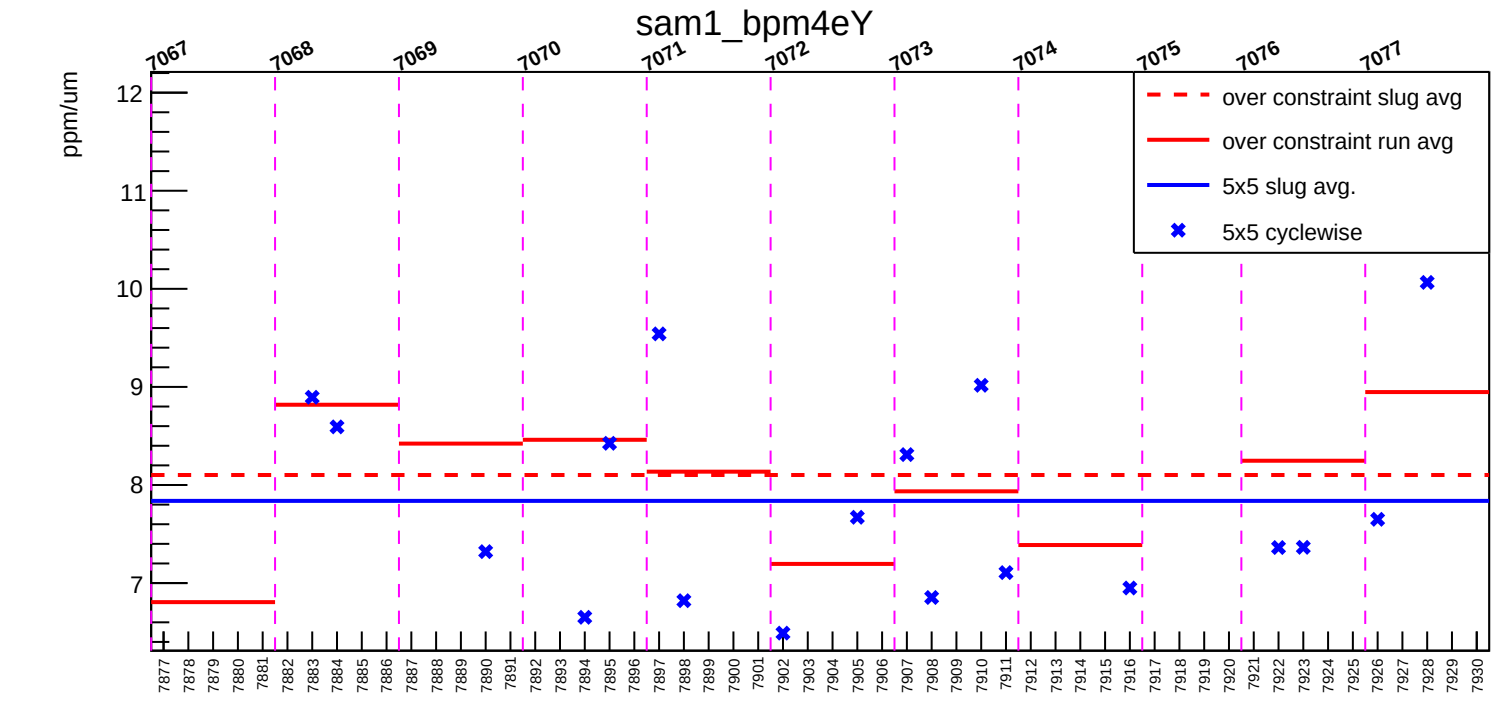
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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10
9
8
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7071
7072
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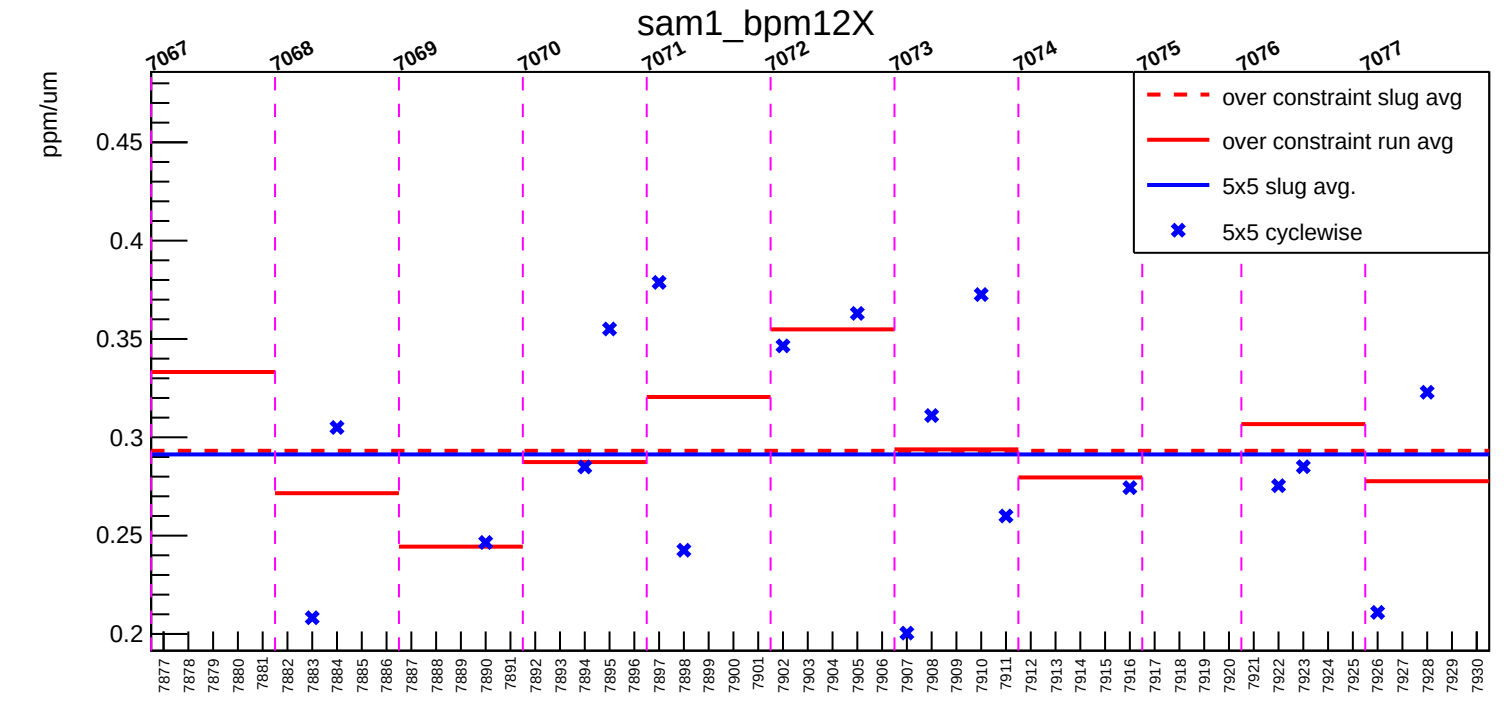
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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ppm/um
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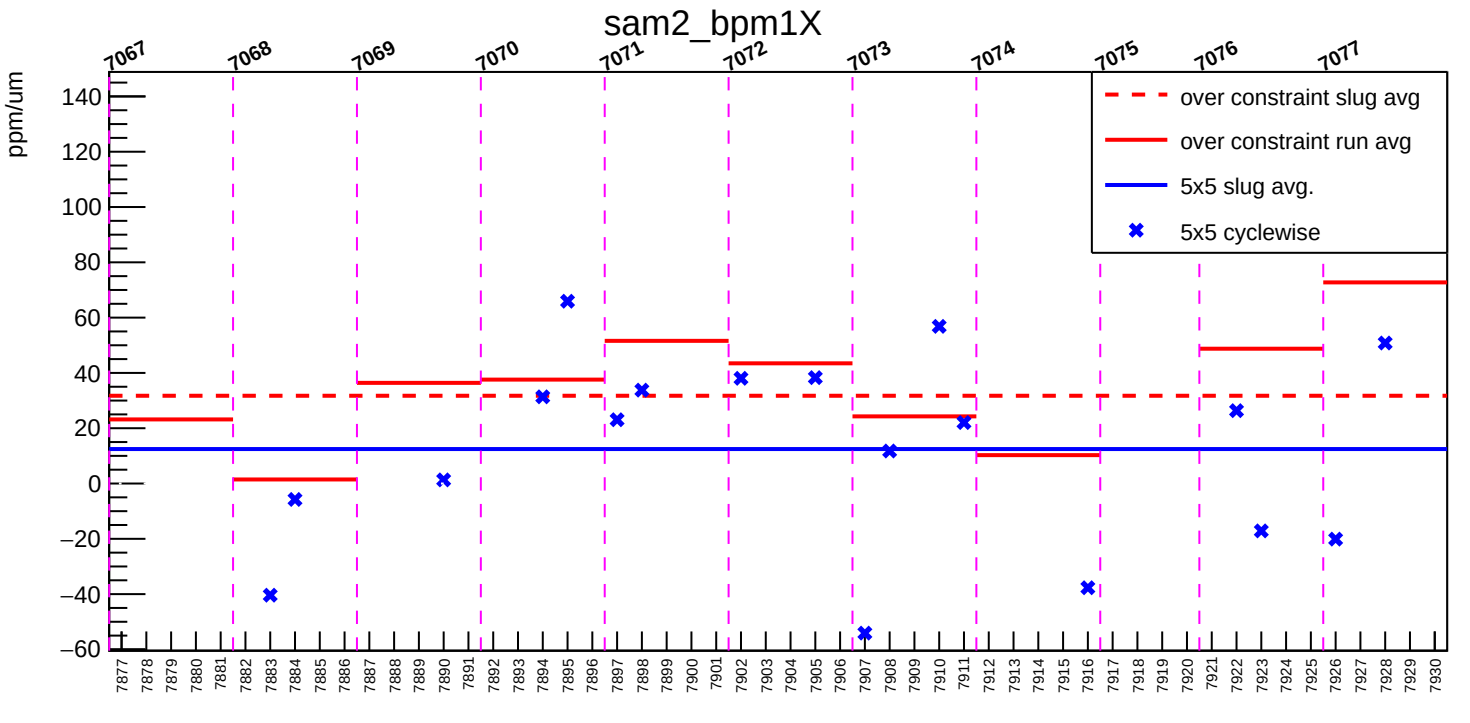
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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ppm/um
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7068
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7077
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over constraint slug avg
over constraint run avg
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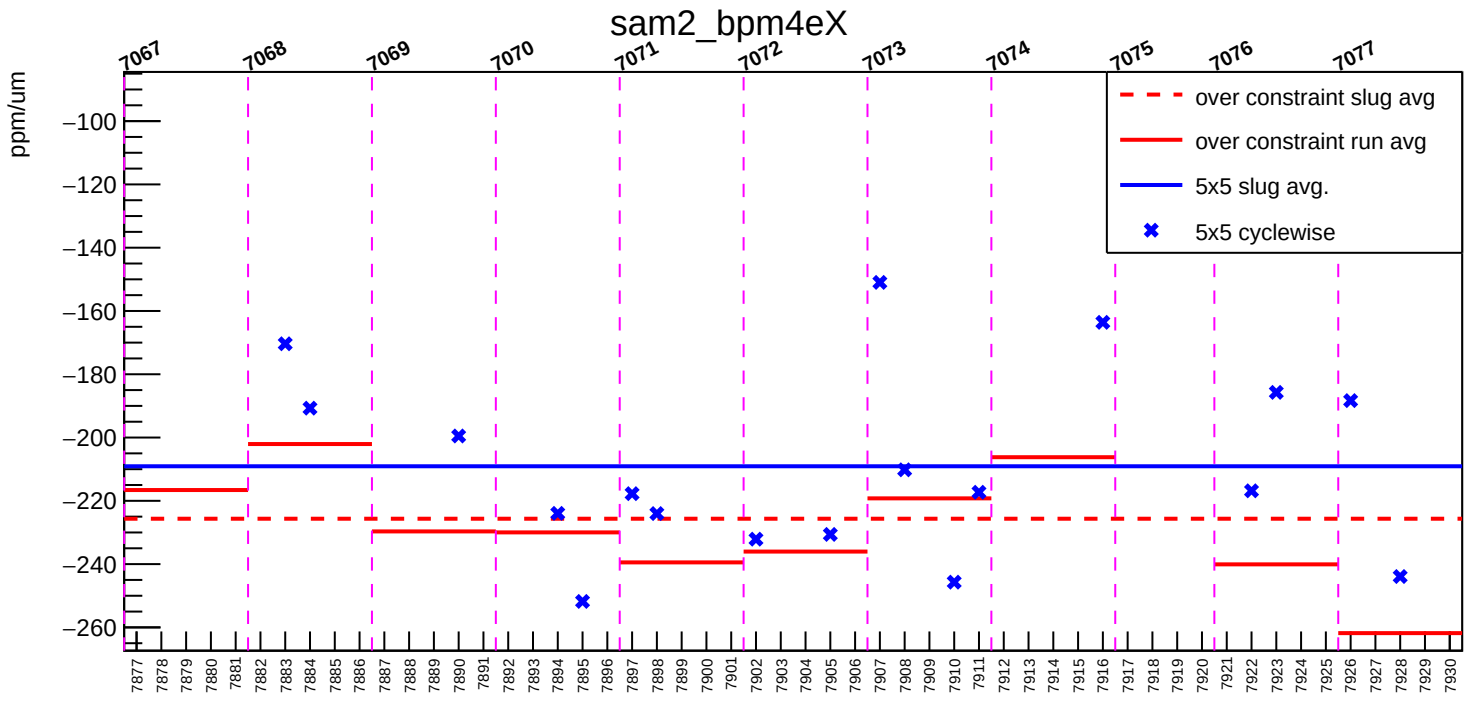
5x5 cyclewise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over constraint run avg
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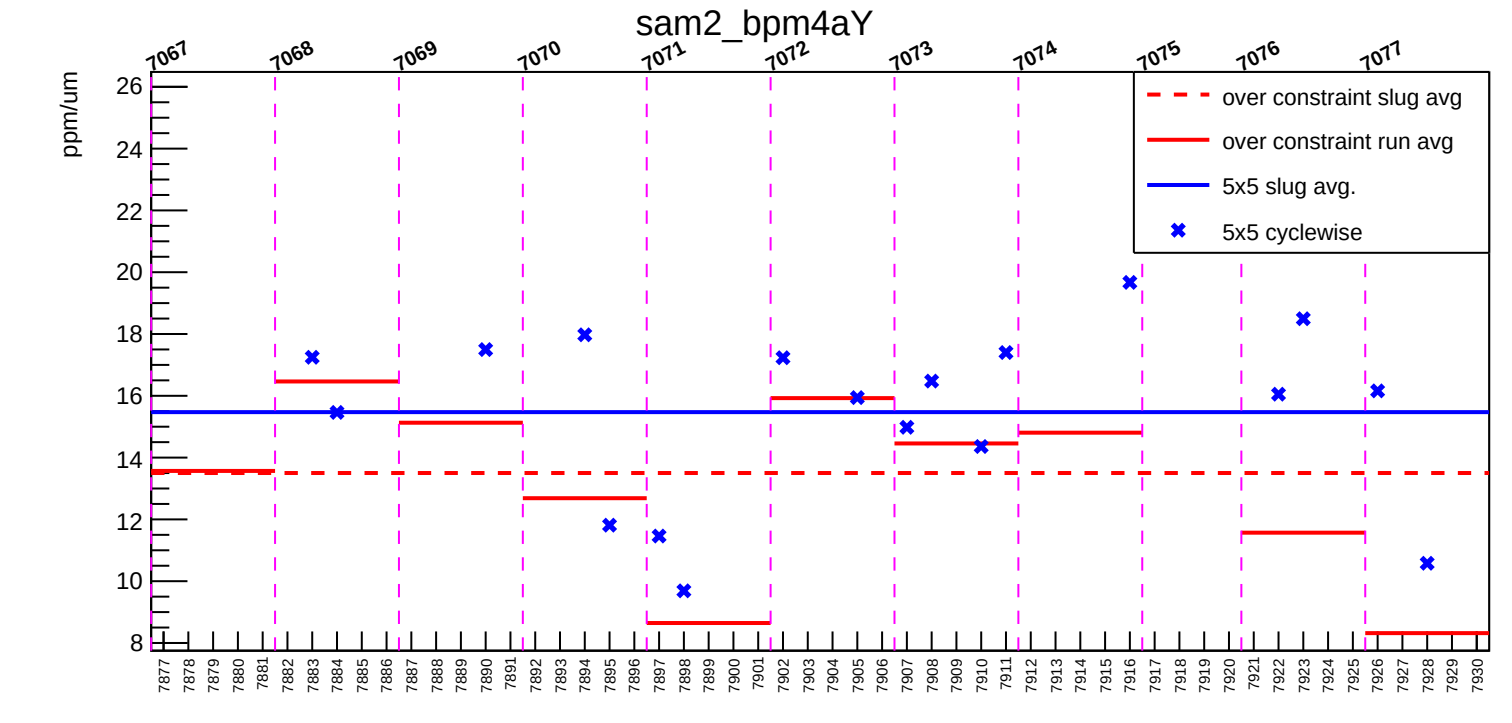
5x5 cyclewise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ppm/um
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18
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12
10
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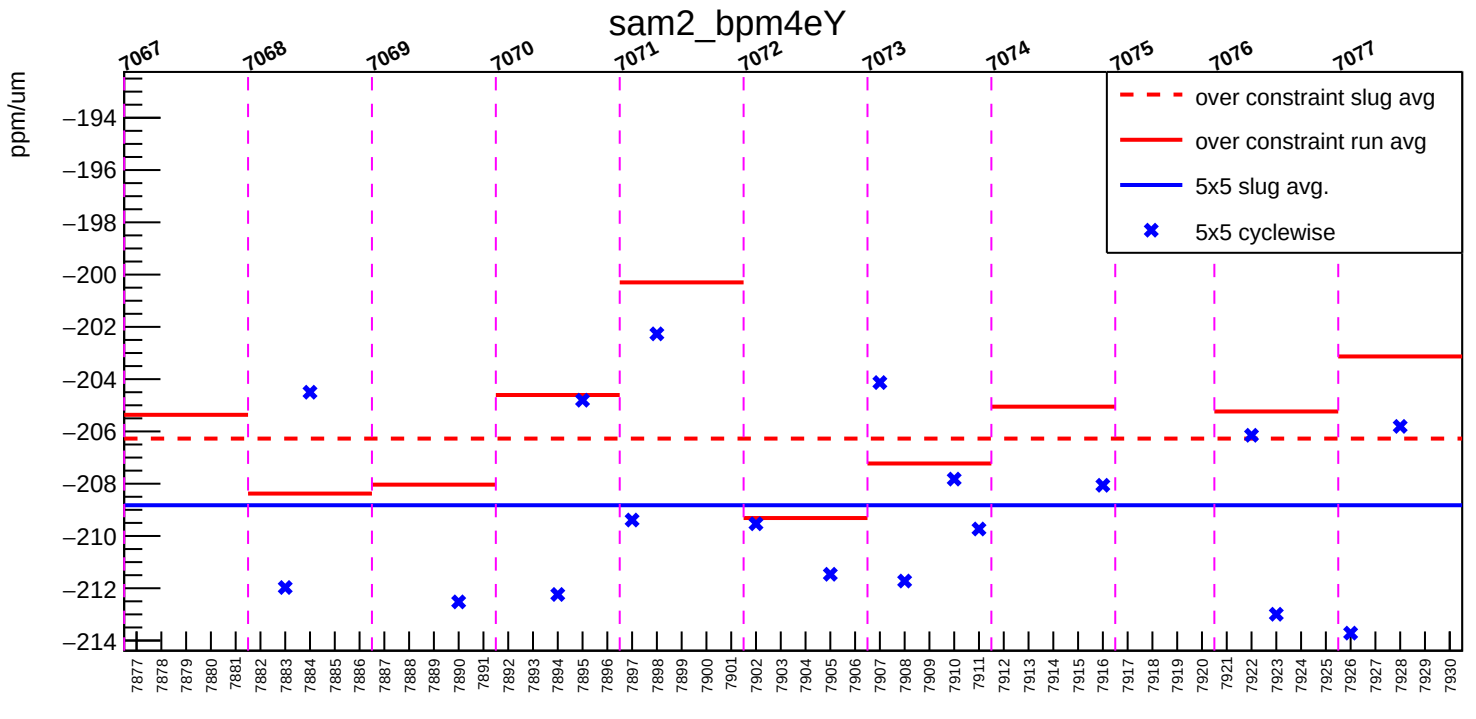
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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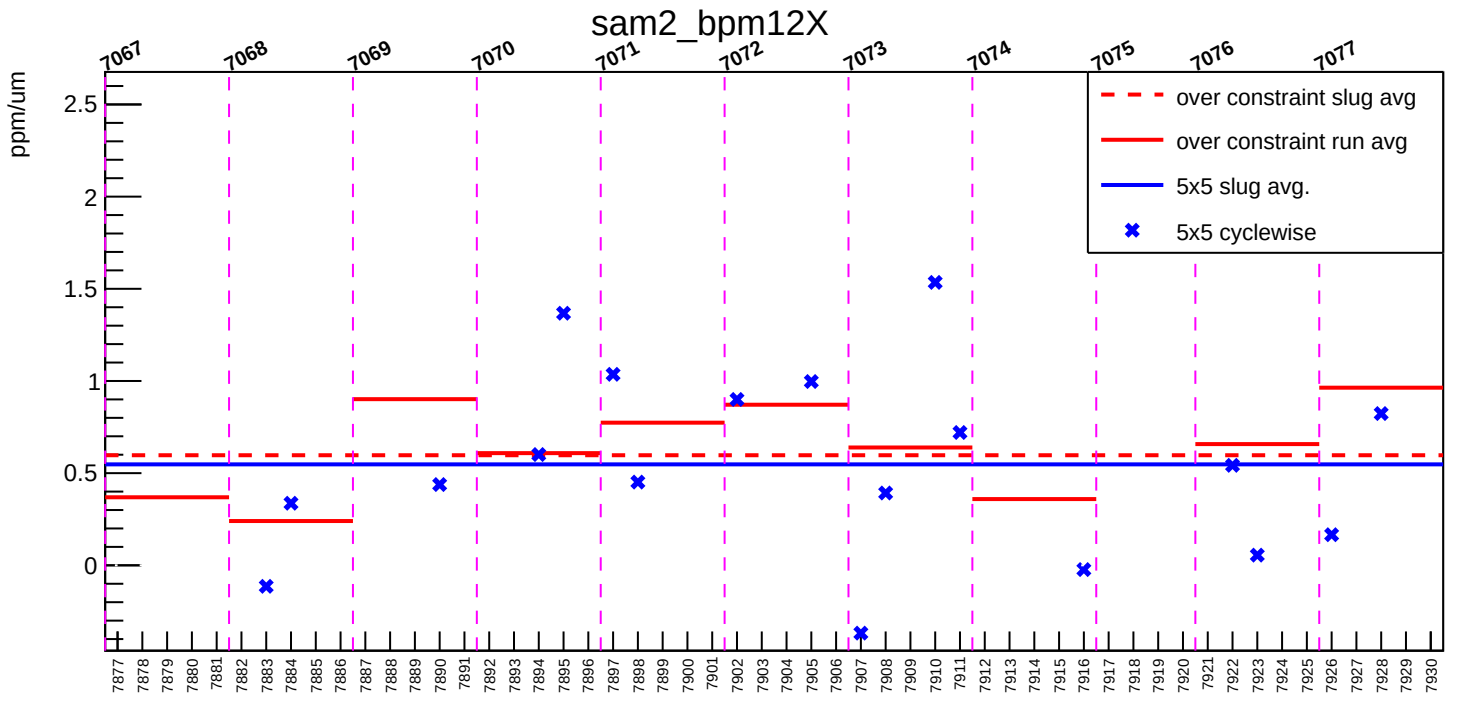
over constraint run avg
5x5 slug avg.
5x5 cyclewise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1.5
1
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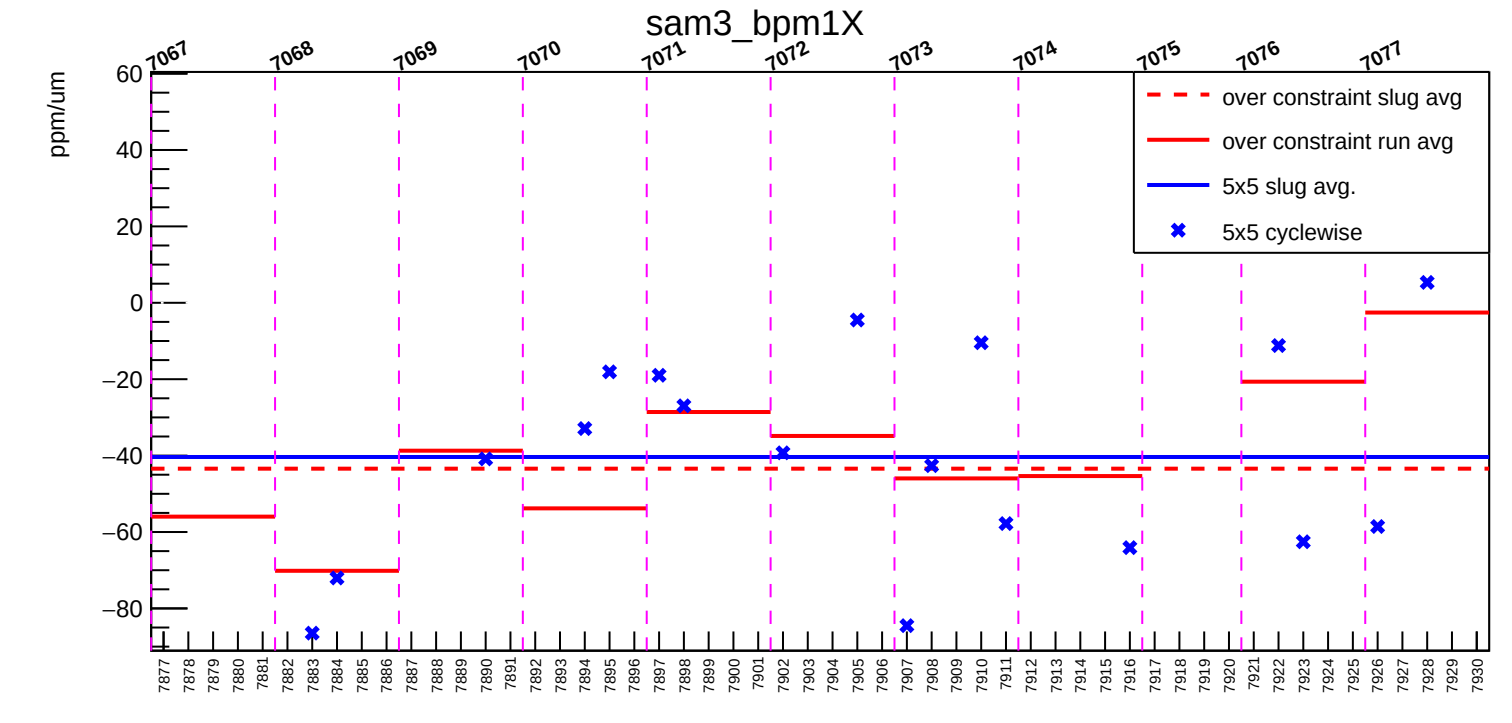
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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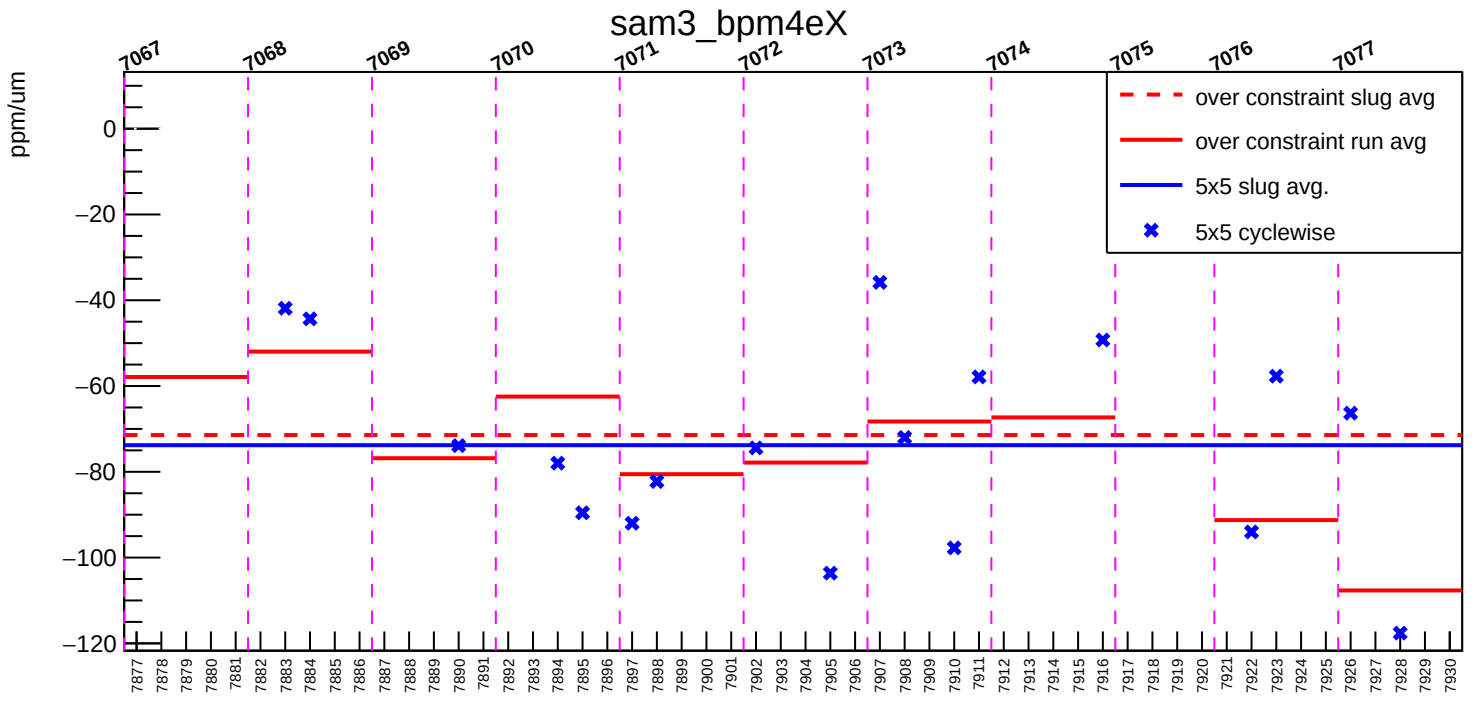
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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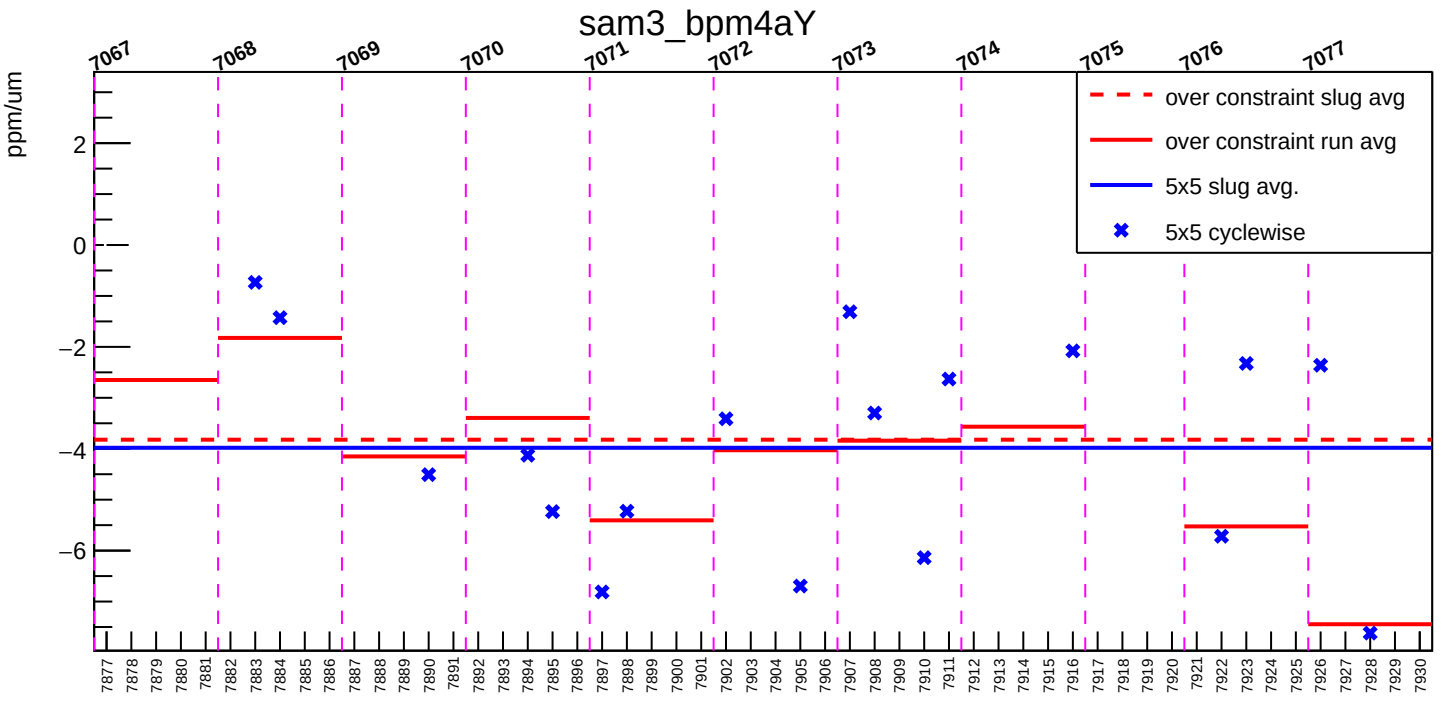
7068
7069
7070
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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−6
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7069
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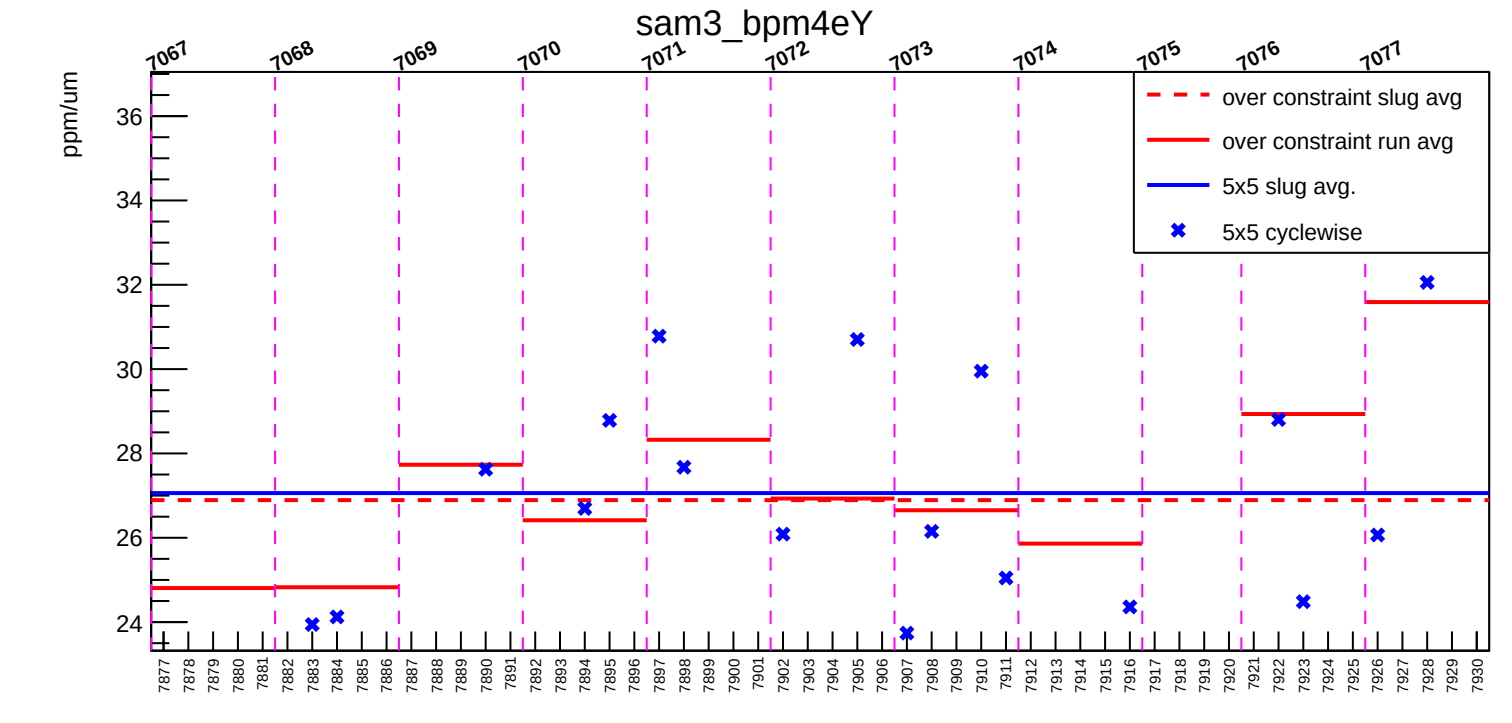
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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ppm/um
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32
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28
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7077
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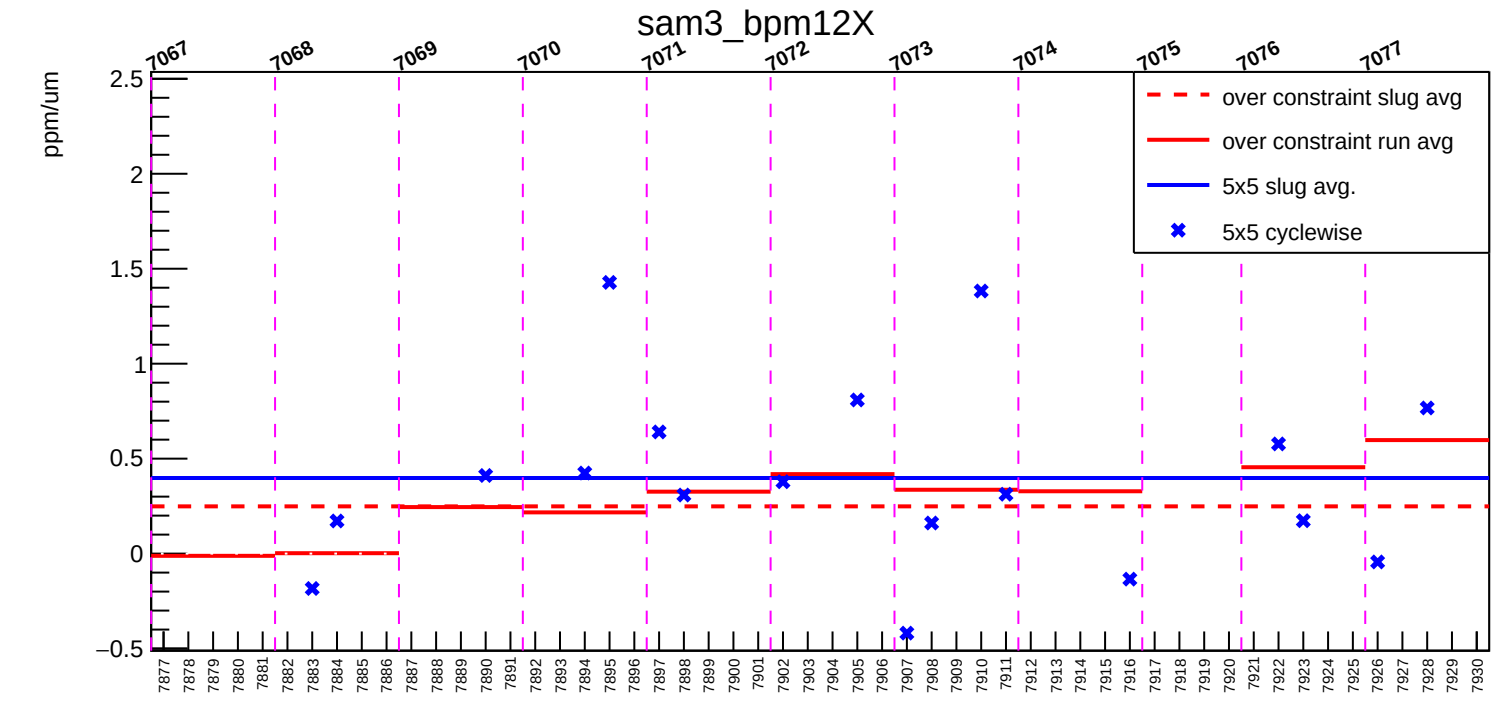
over constraint run avg
5x5 slug avg.
5x5 cyclewise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0.5
0
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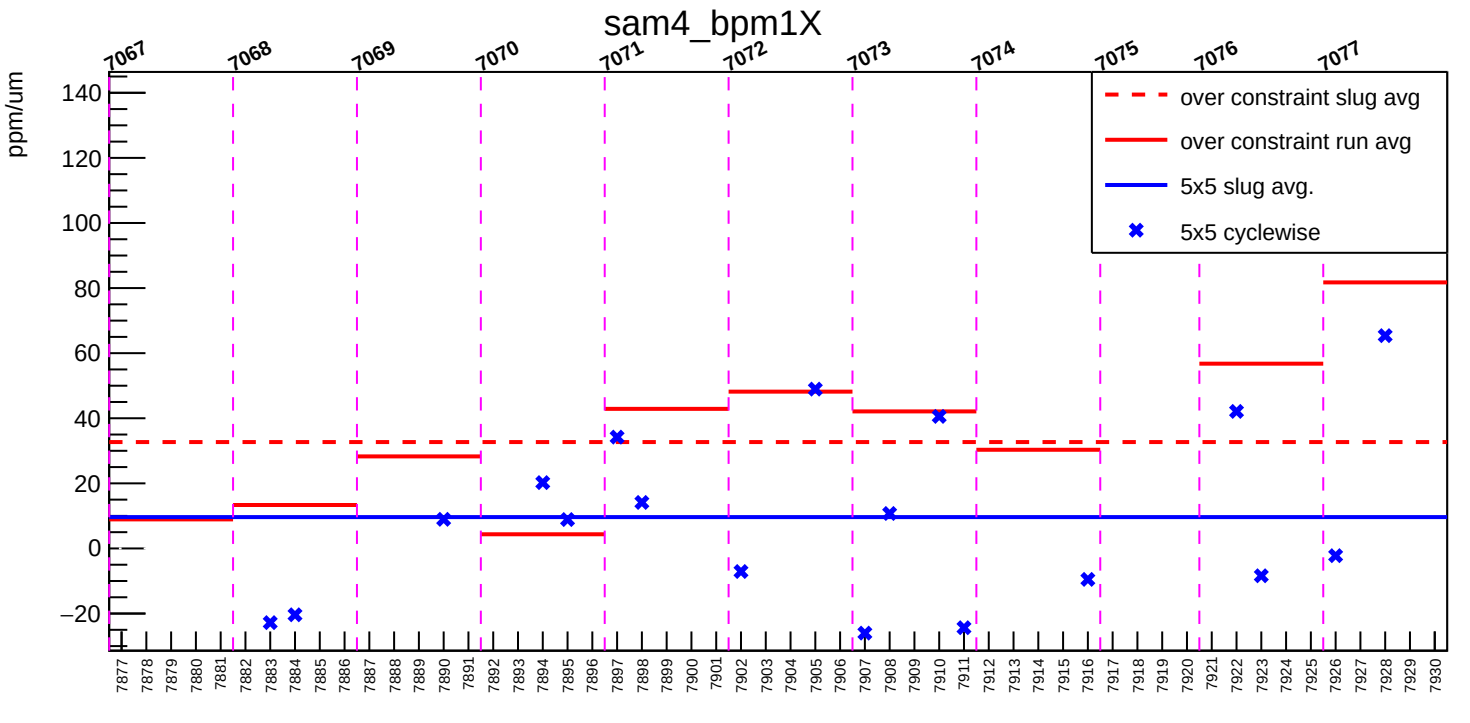
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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7071
7072
7073
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7075
7076
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60
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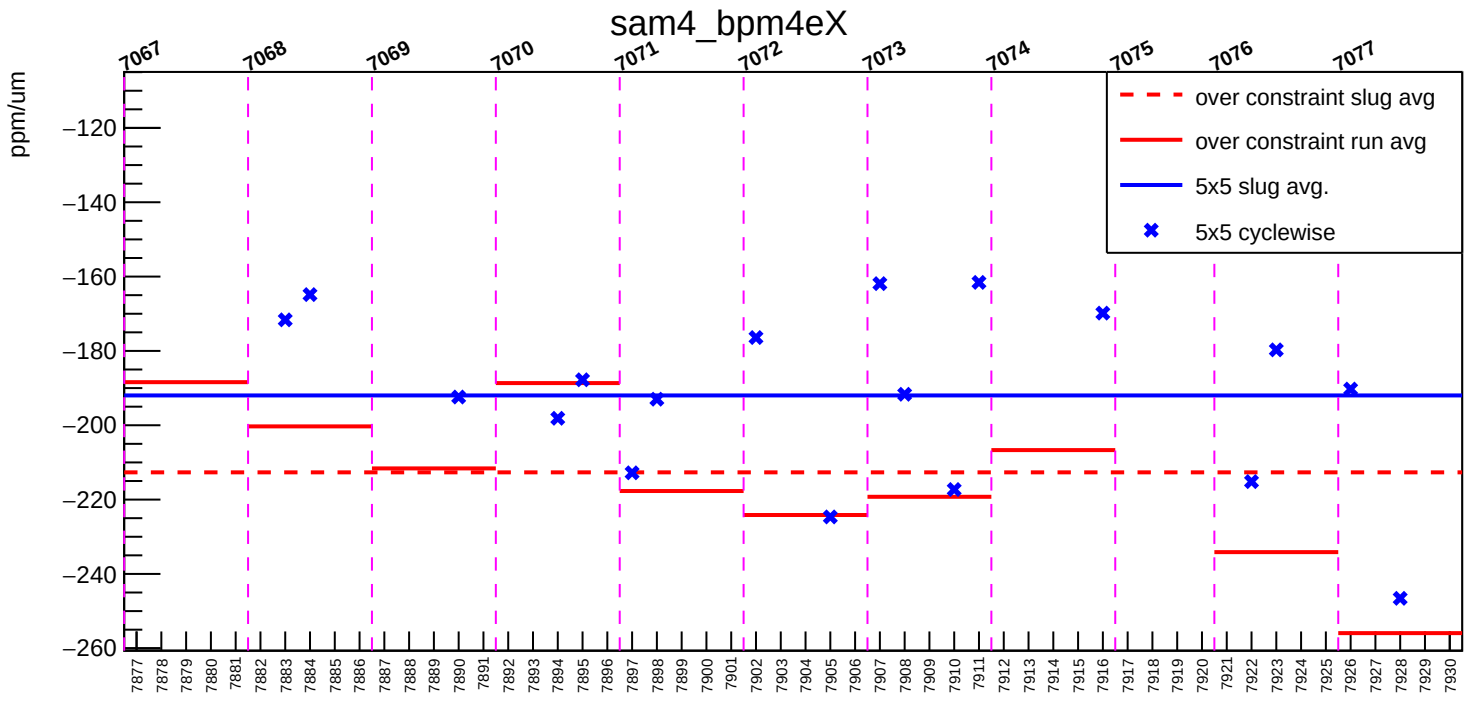
20
0
−20
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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7068
7069
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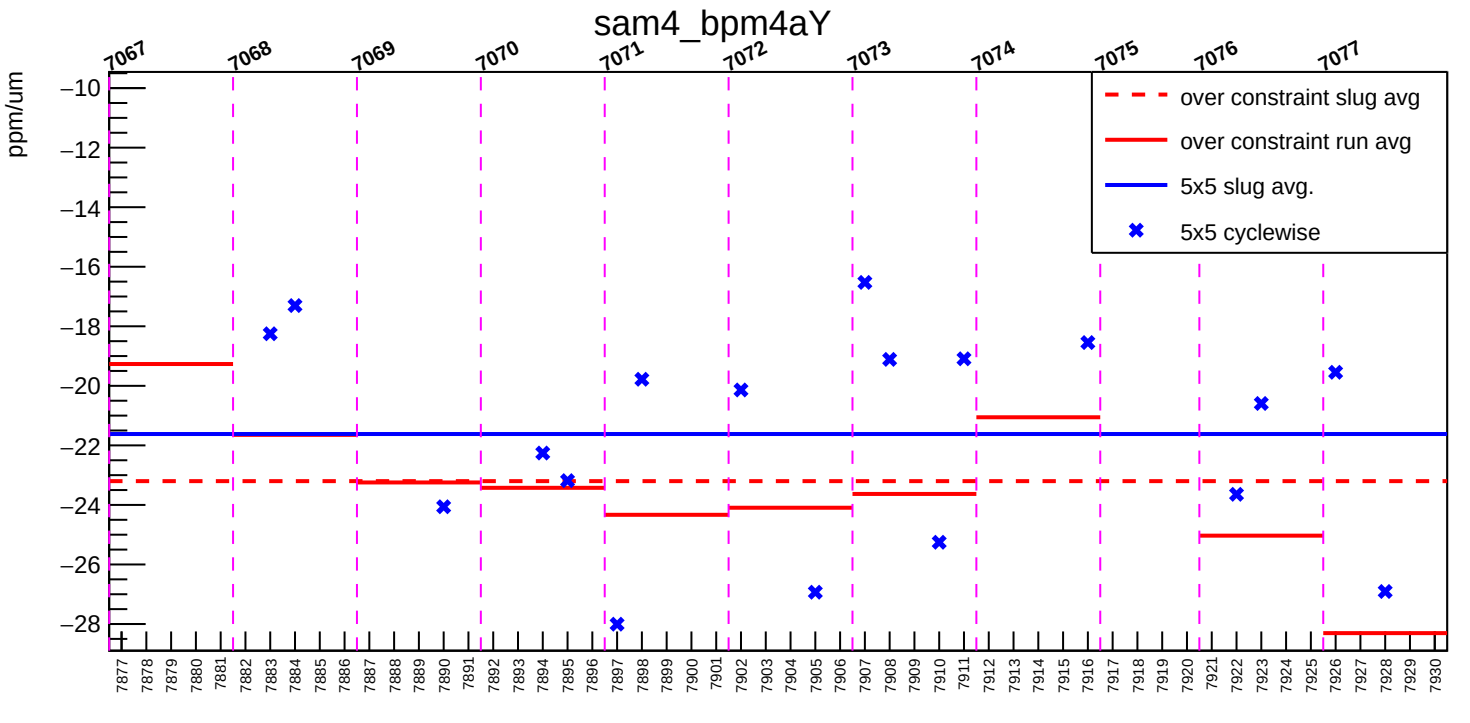
over constraint run avg
5x5 slug avg.
5x5 cyclewise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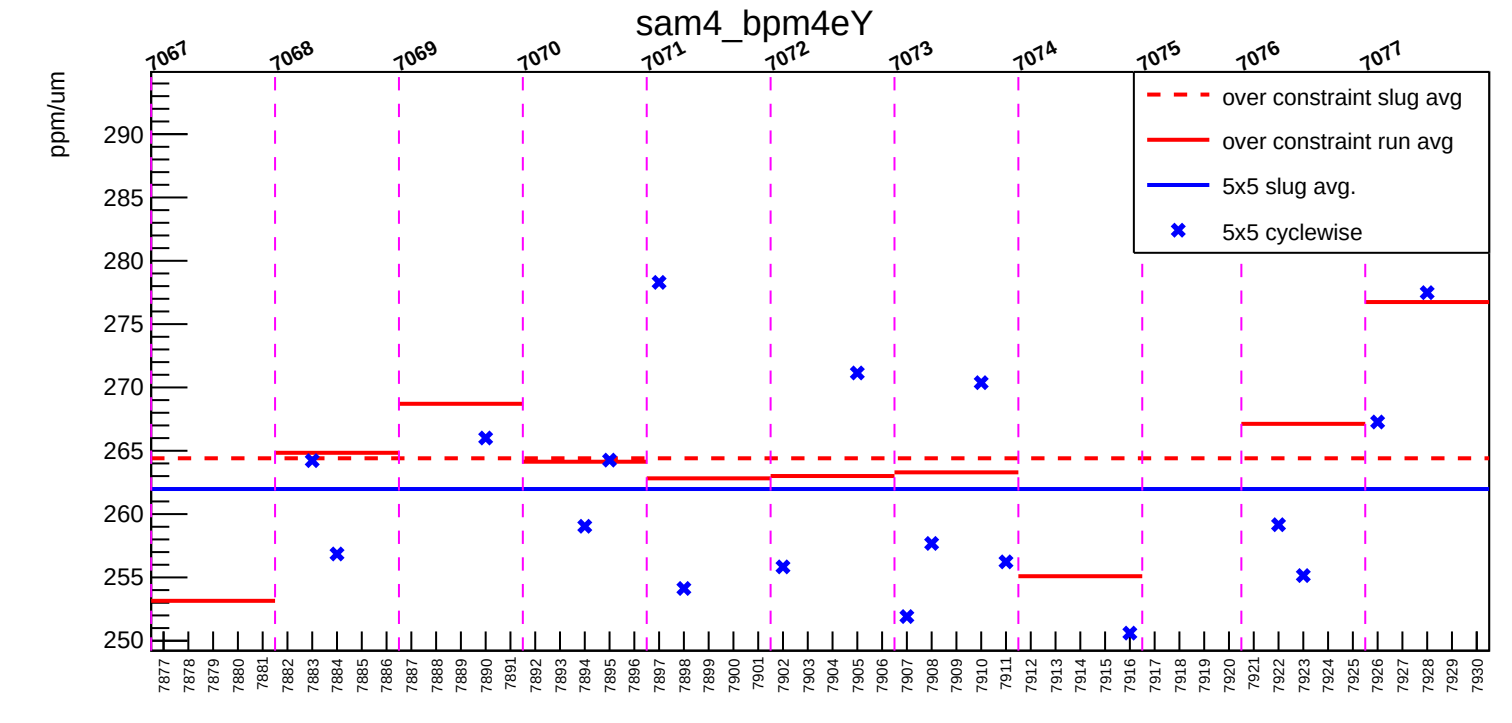
over constraint run avg
5x5 slug avg.
5x5 cyclewise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7069
7070
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7074
7075
7076
7077
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275
270
265
260
255
250
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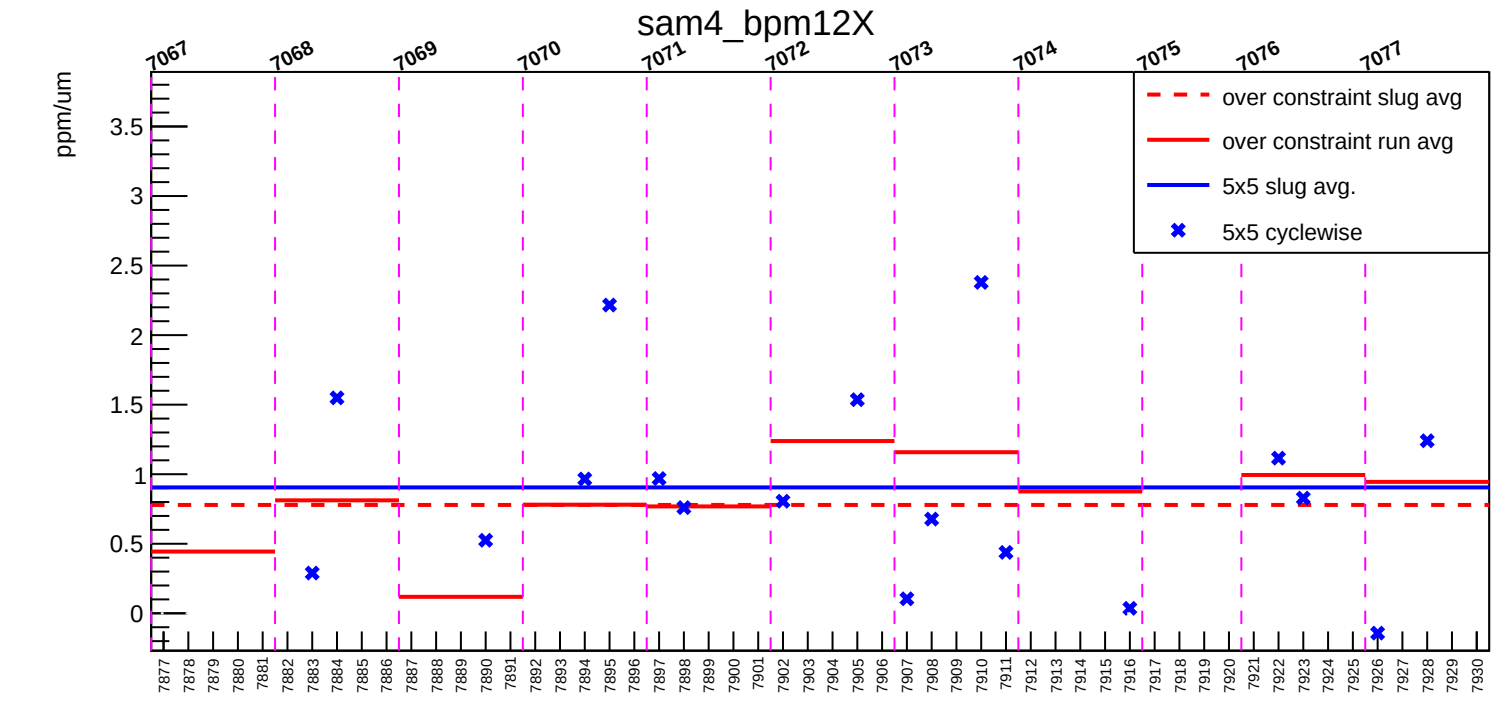
over constraint run avg
5x5 slug avg.
5x5 cyclewise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7069
7070
7071
7072
7073
7074
7075
7076
7077
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3
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1.5
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0.5
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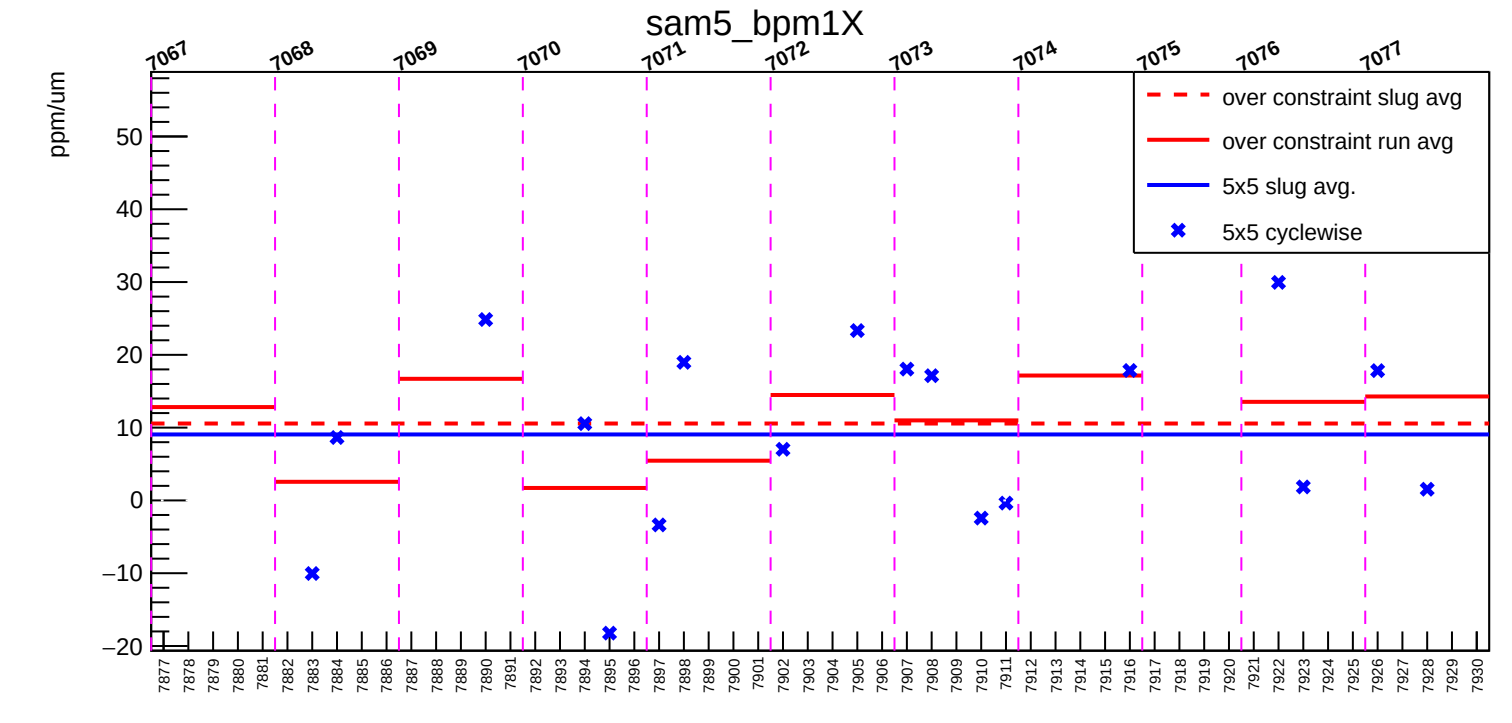
over constraint run avg
5x5 slug avg.
5x5 cyclewise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7076
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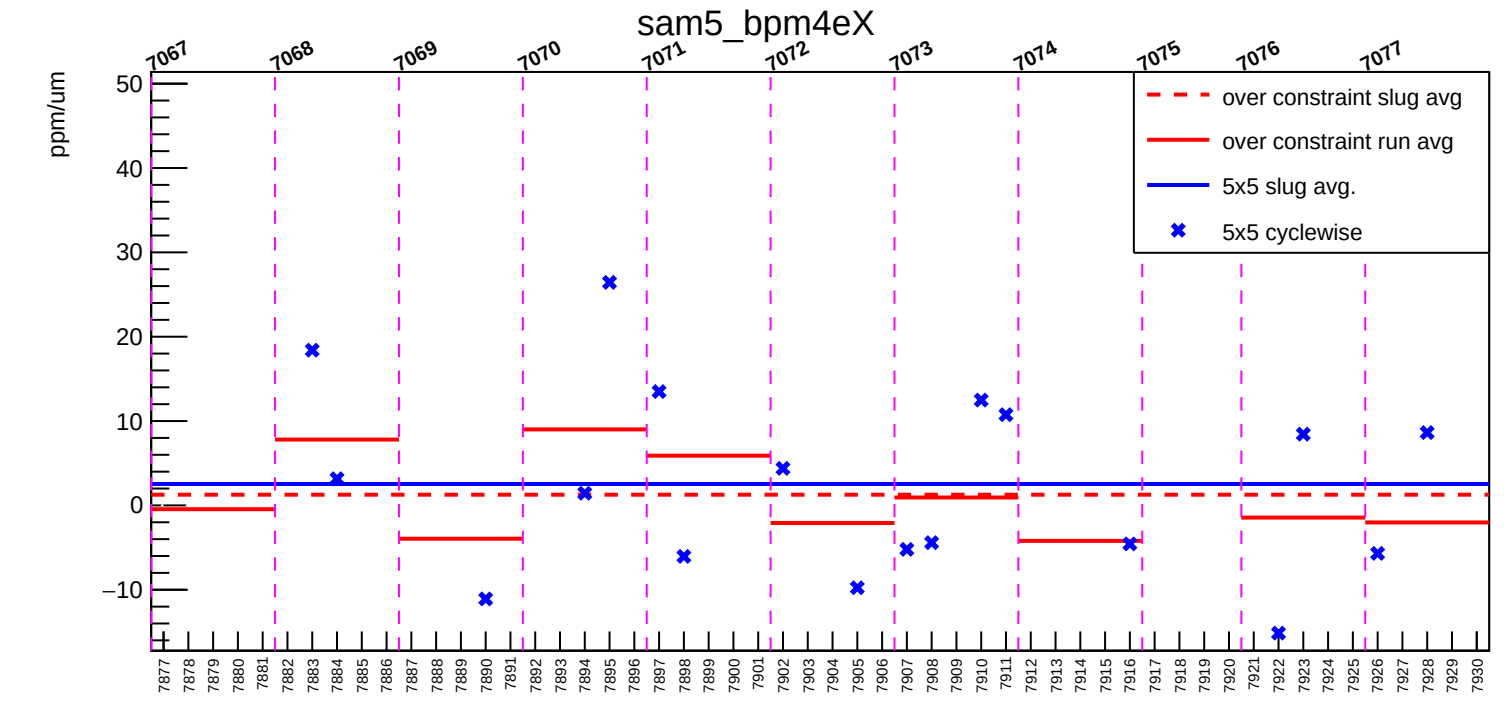
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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7069
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7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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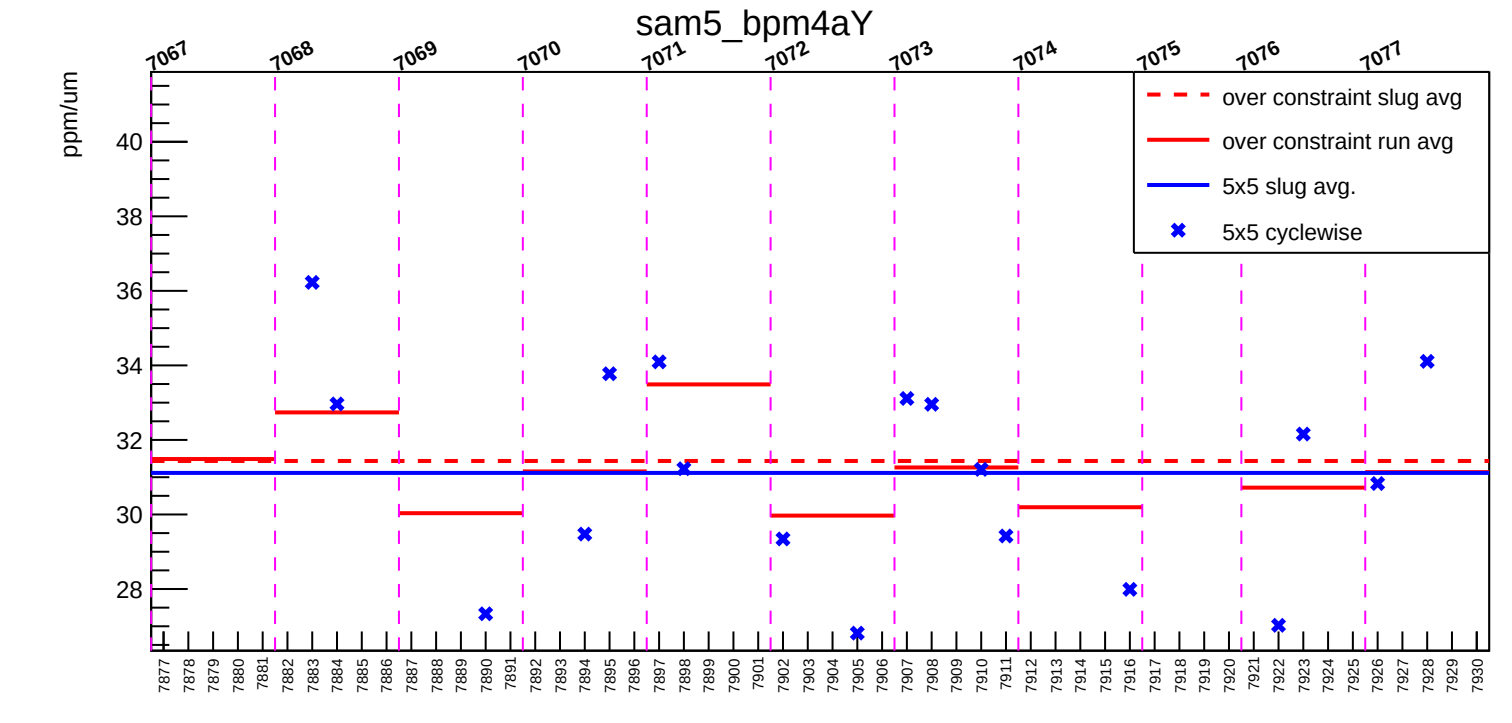
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ppm/um
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36
34
32
30
28
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7068
7069
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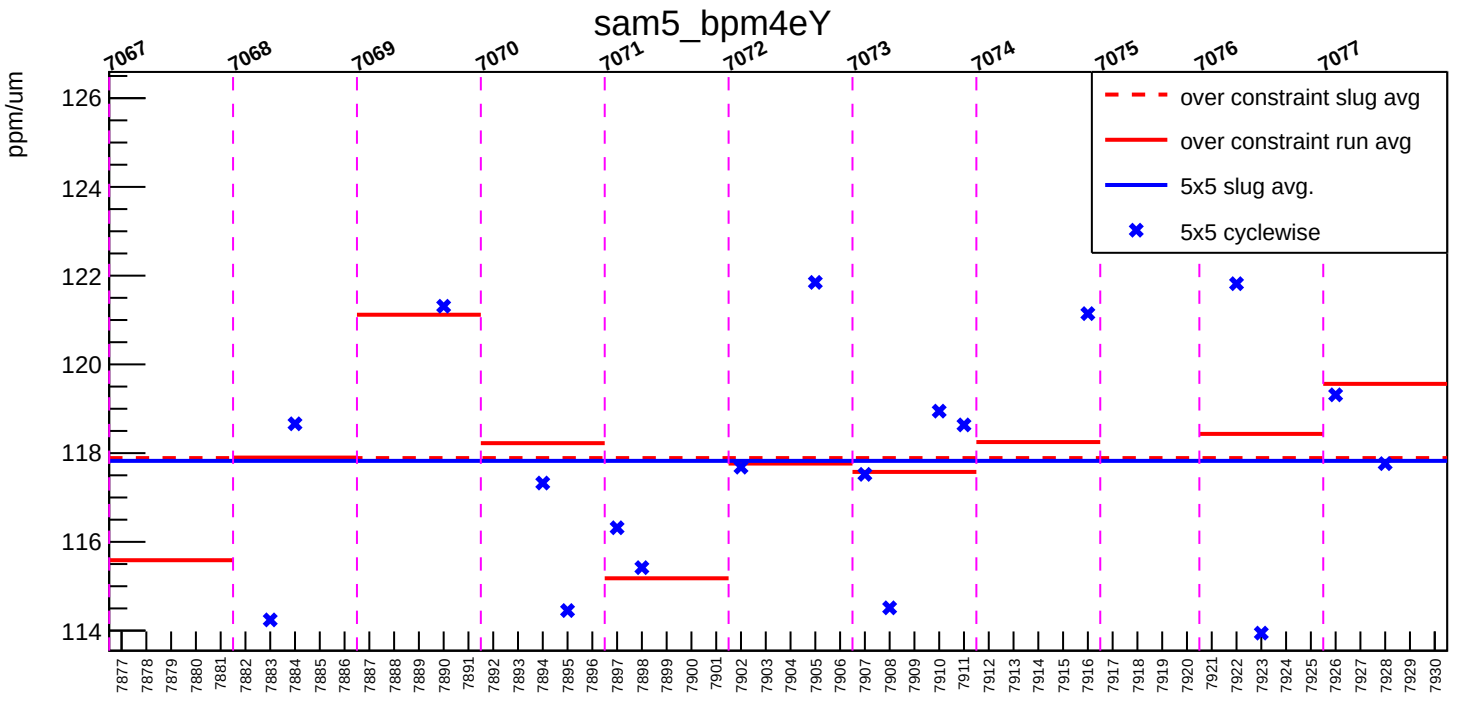
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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122
120
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116
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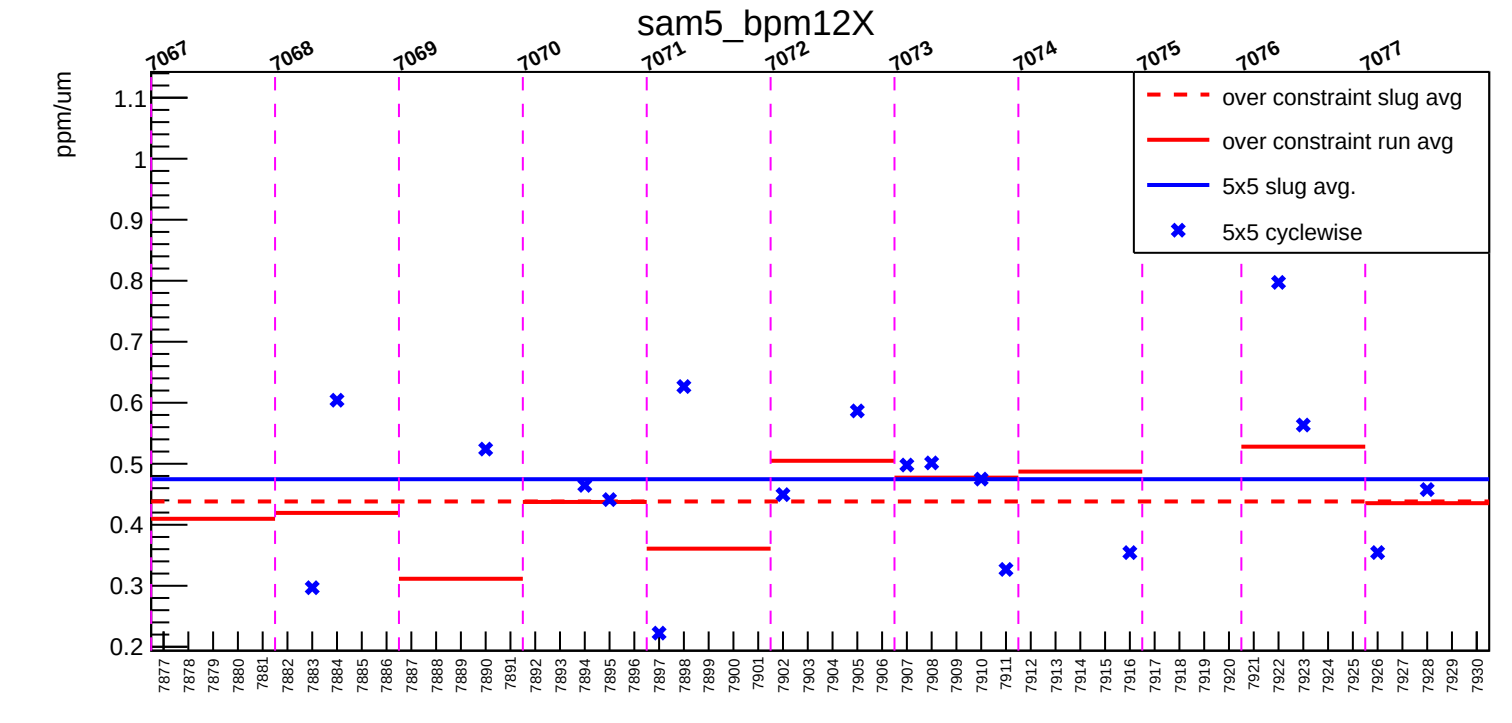
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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0.4
0.3
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7067
7068
7069
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7076
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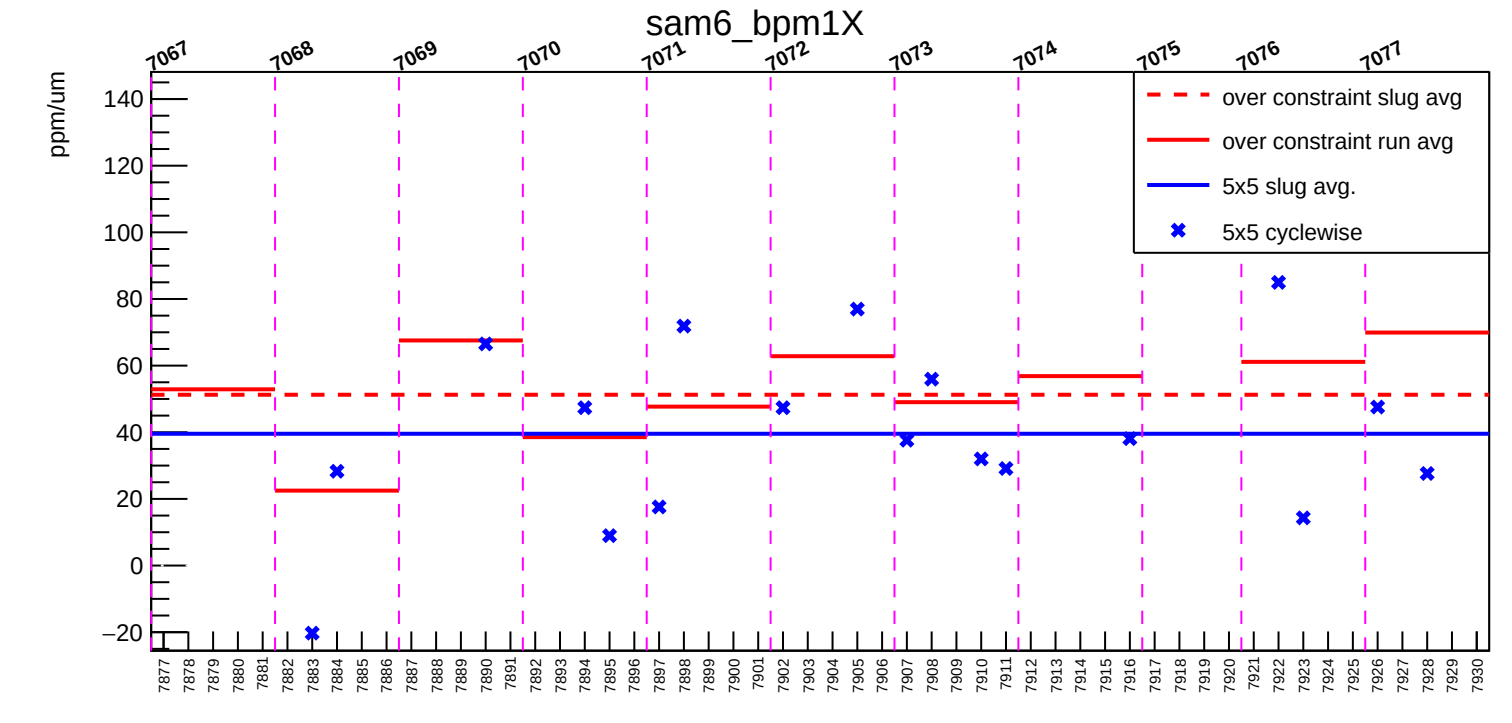
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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7073
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7075
7076
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60
40
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0
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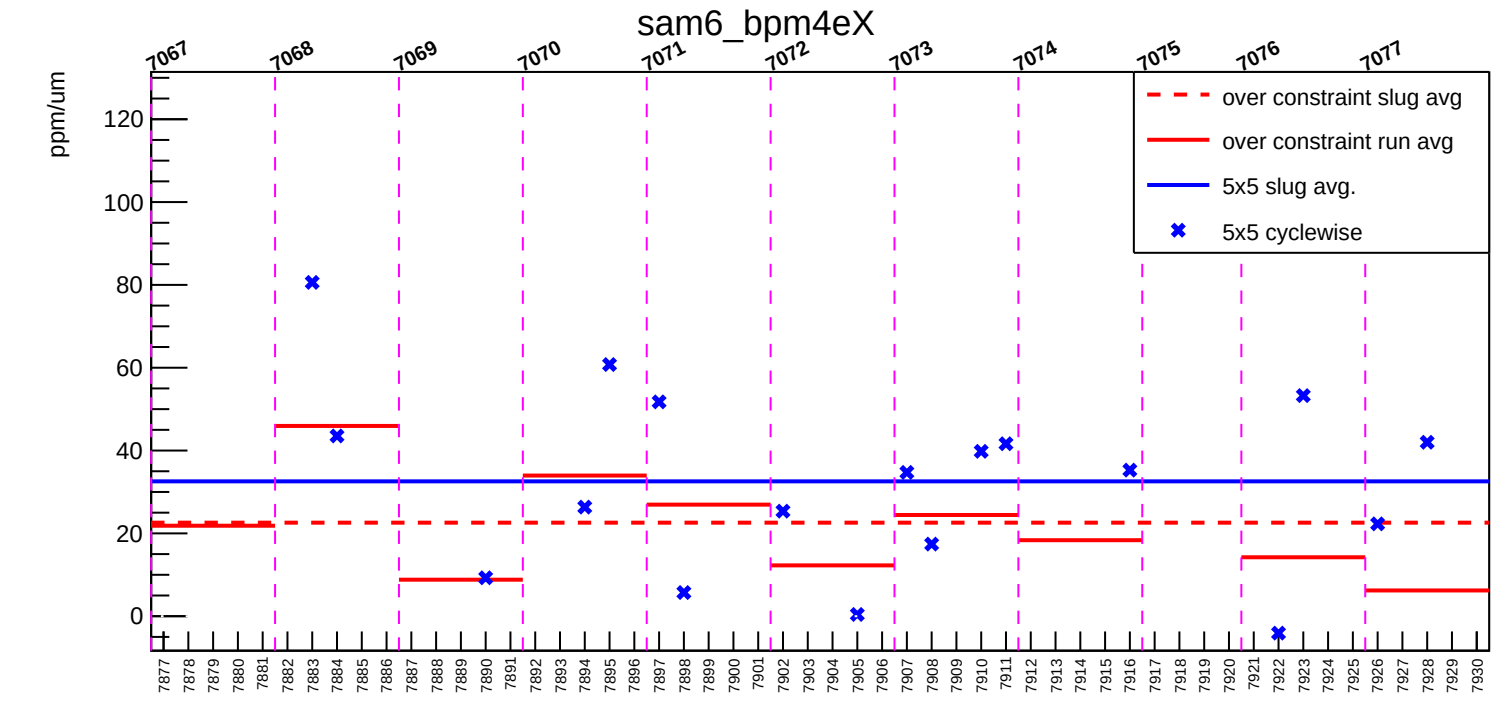
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise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ppm/um
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7075
7076
7077
120
100
80
60
40
20
0
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
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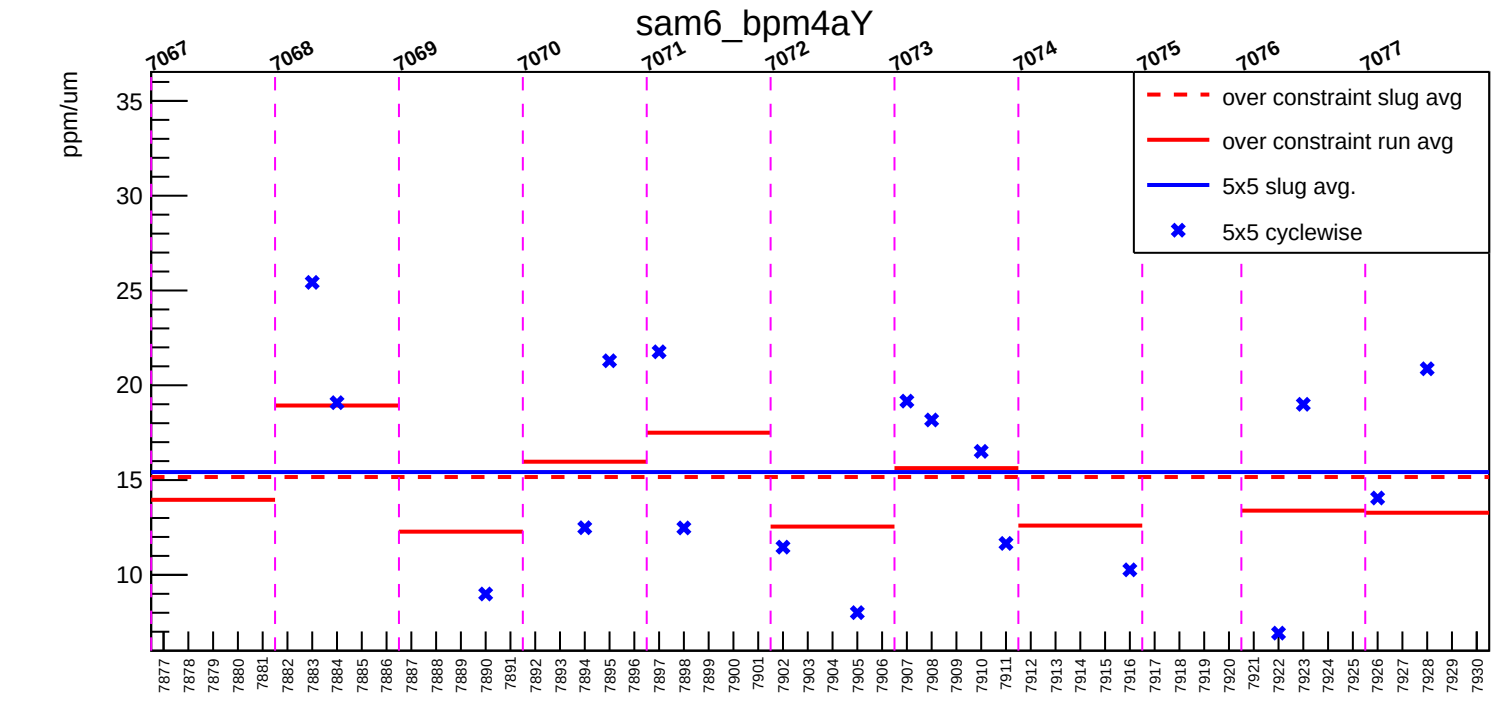
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ppm/um
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30
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20
15
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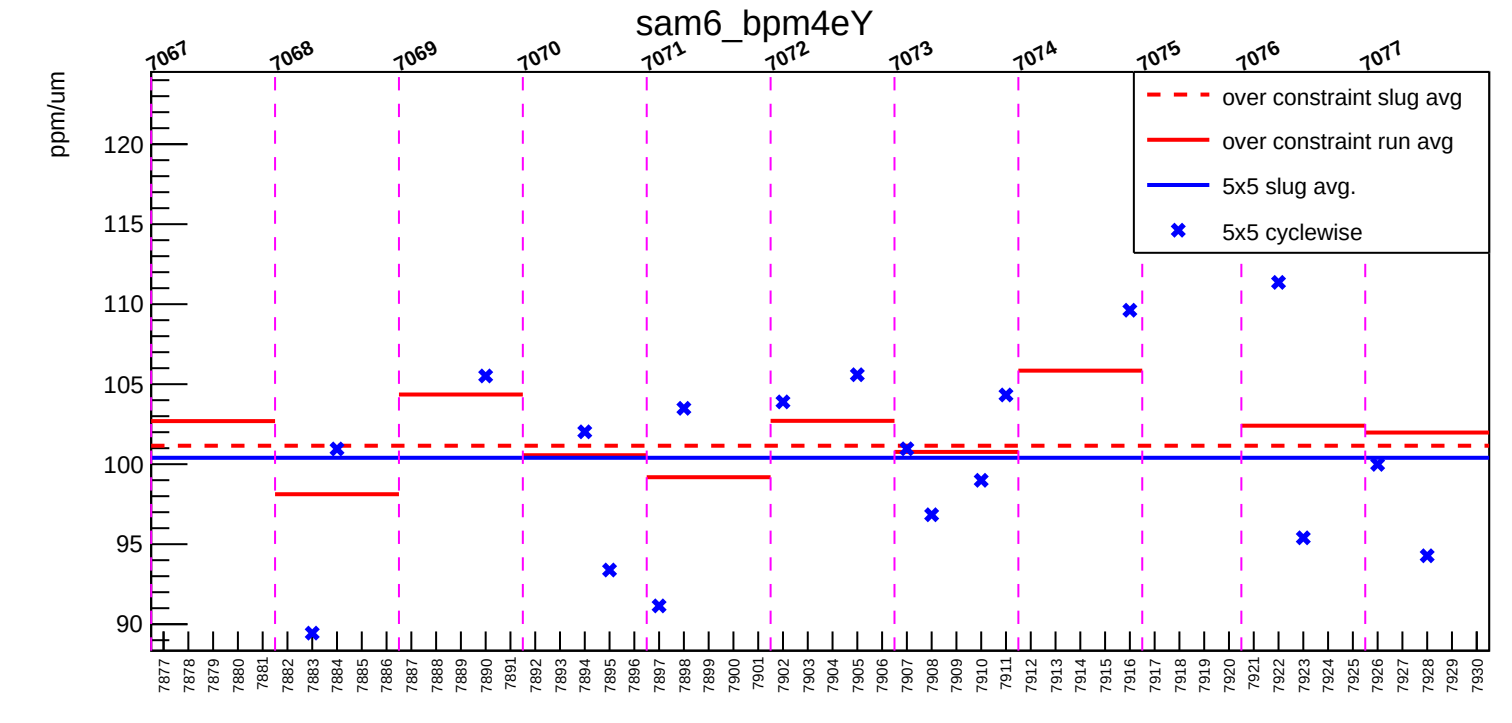
7070
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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ppm/um
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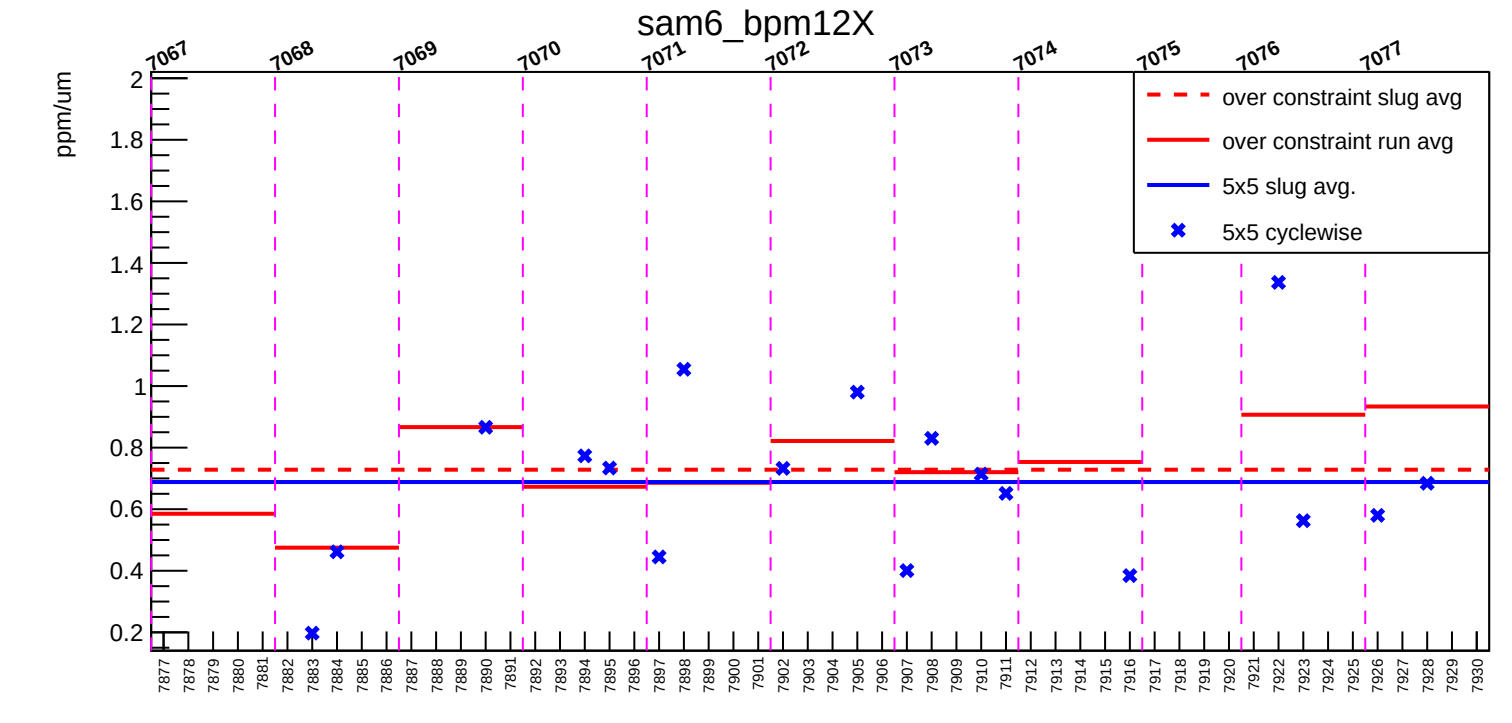
5x5 cyclewise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ppm/um
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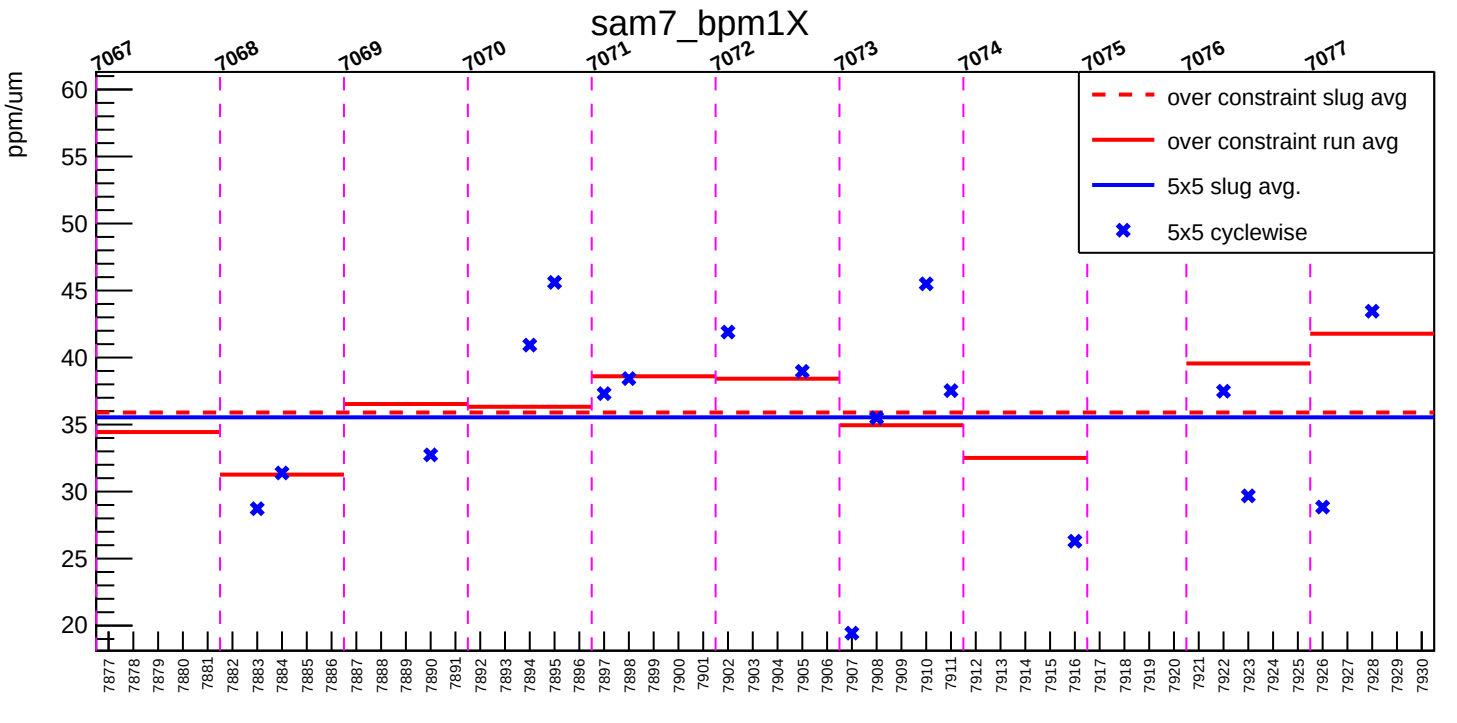
over constraint run avg
5x5 slug avg.
5x5 cyclewise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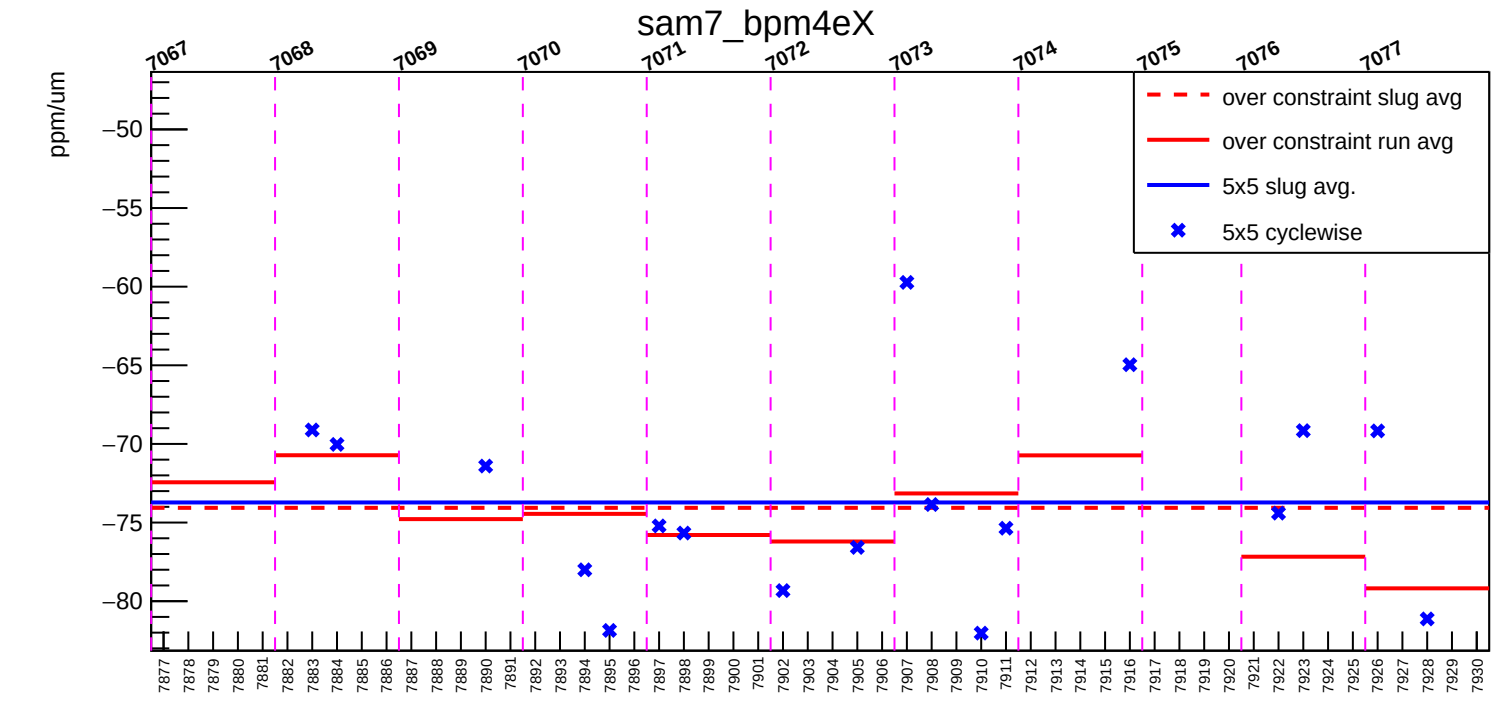
7068
7069
7070
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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−75
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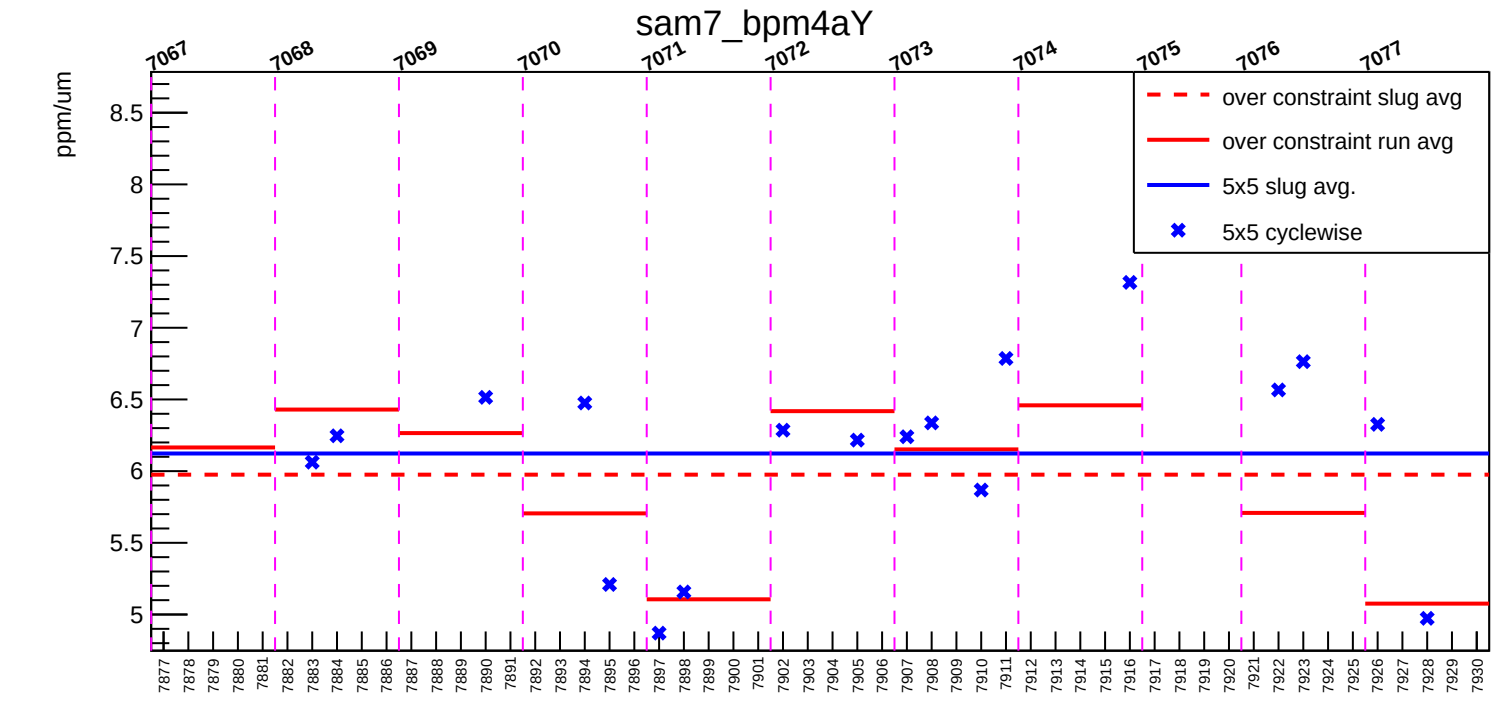
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930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7077
over constraint slug avg
over constraint run avg
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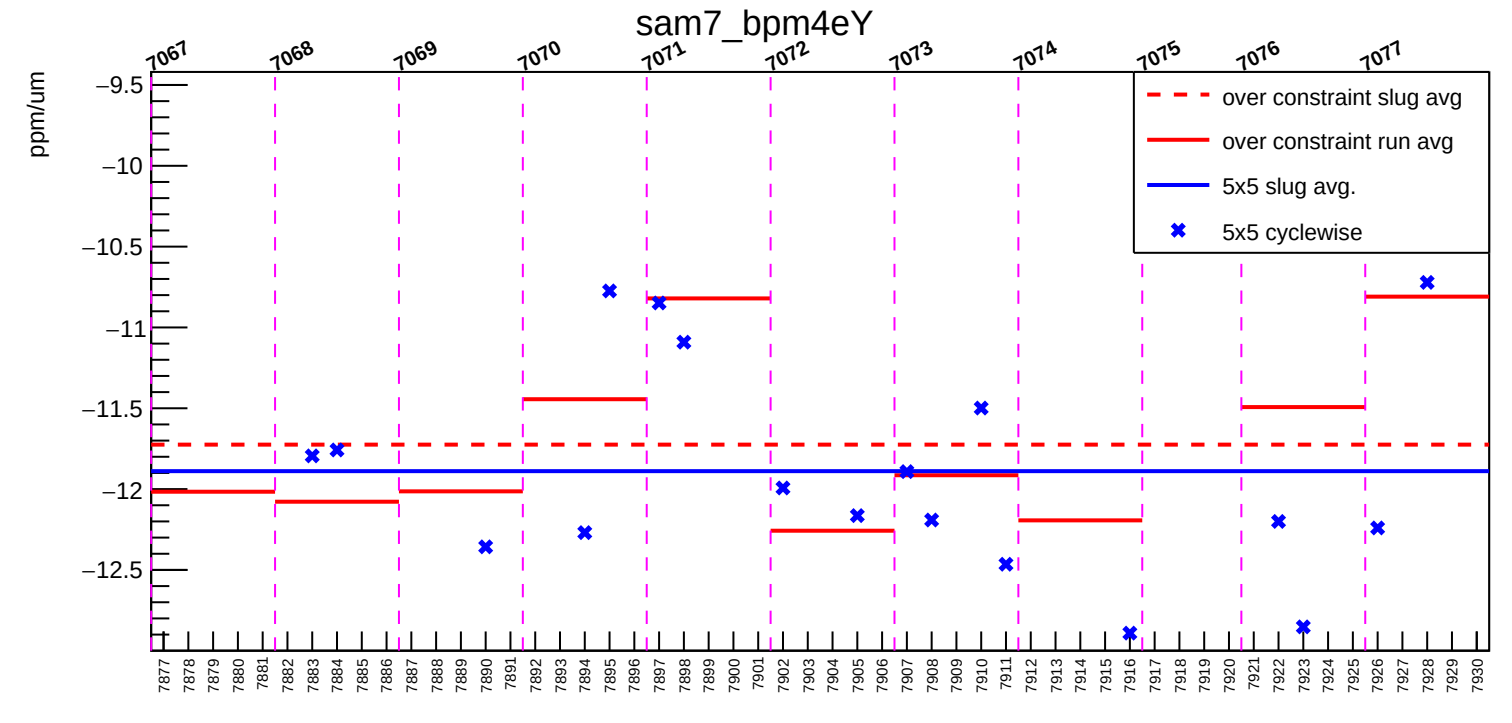
5x5 cyclewise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7069
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over constraint run avg
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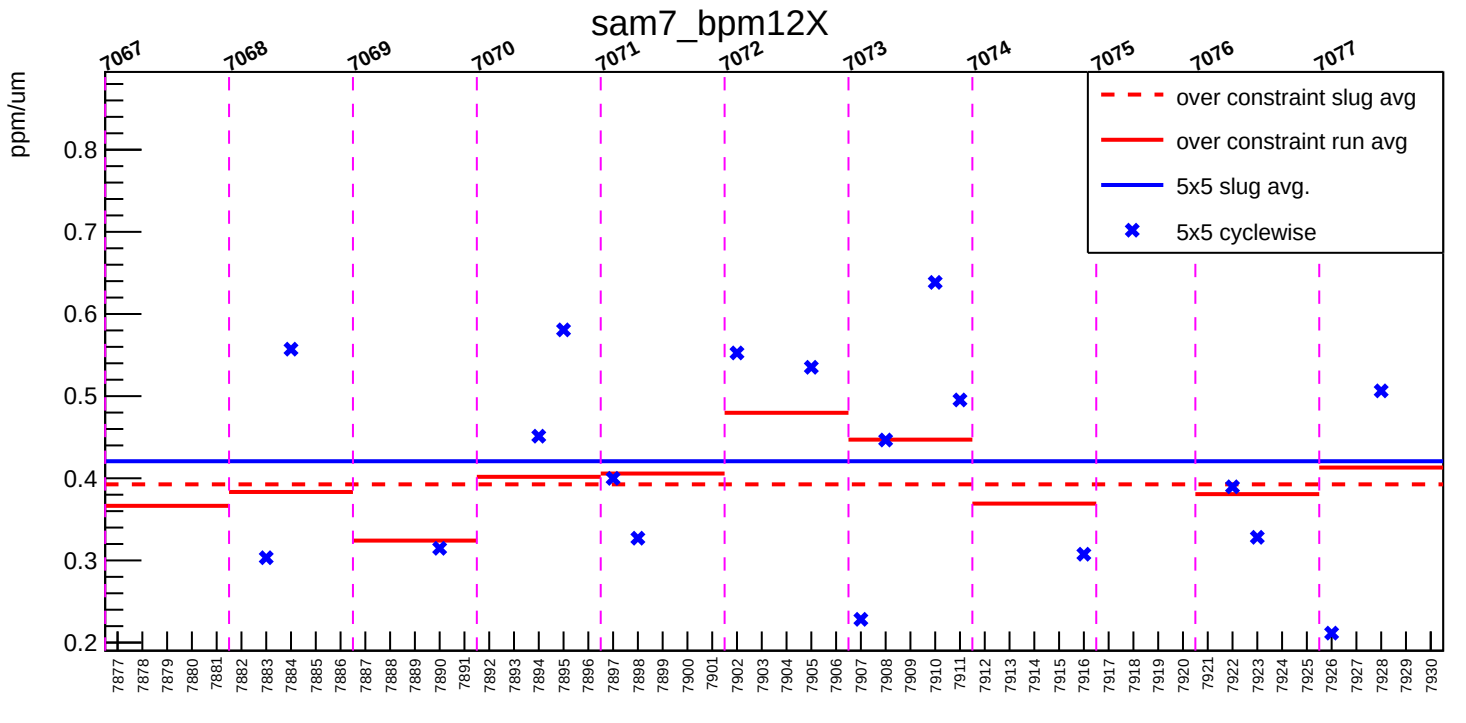
5x5 cyclewise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0.6
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0.3
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7071
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over constraint slug avg
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5x5 slug avg.
5x5 cyclewise
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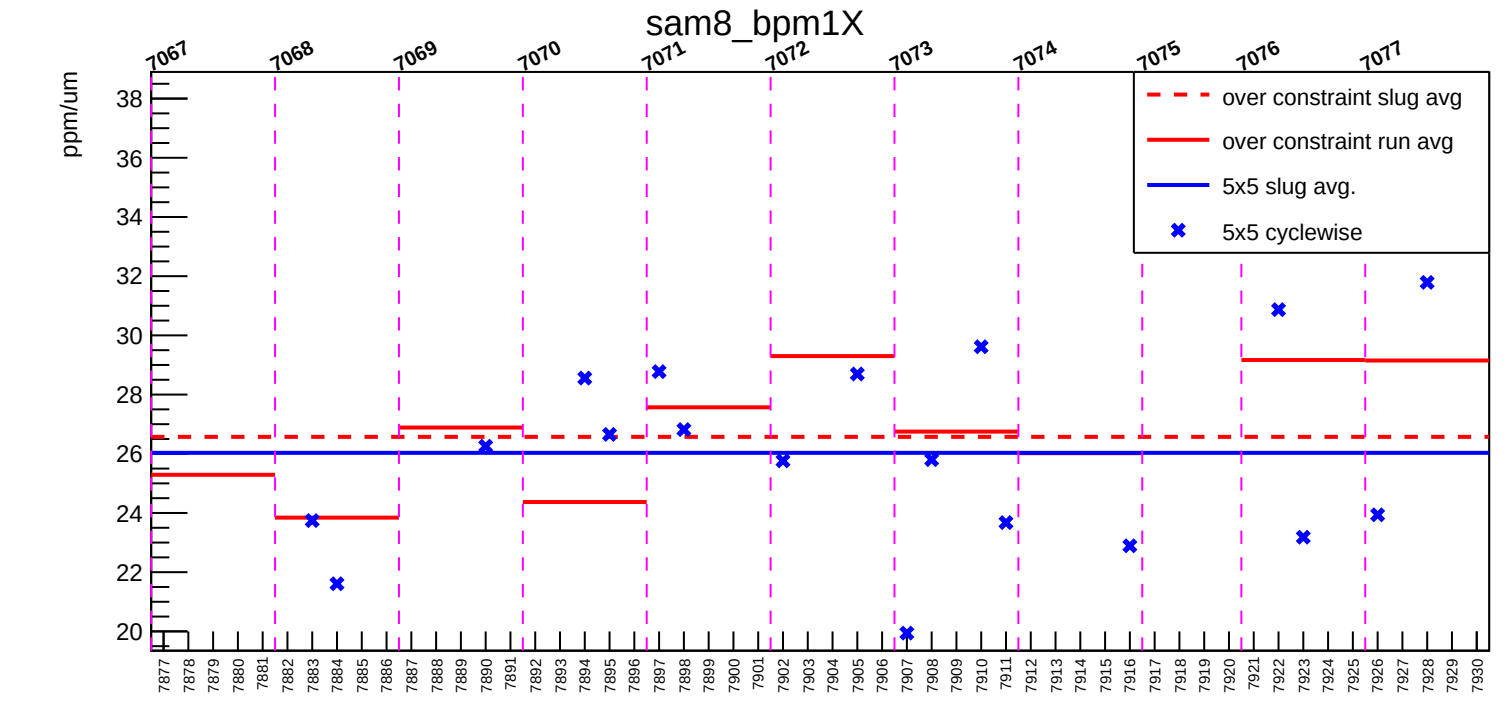
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7071
7072
7073
7074
7075
7076
7077
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30
28
26
24
22
20
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over constraint run avg
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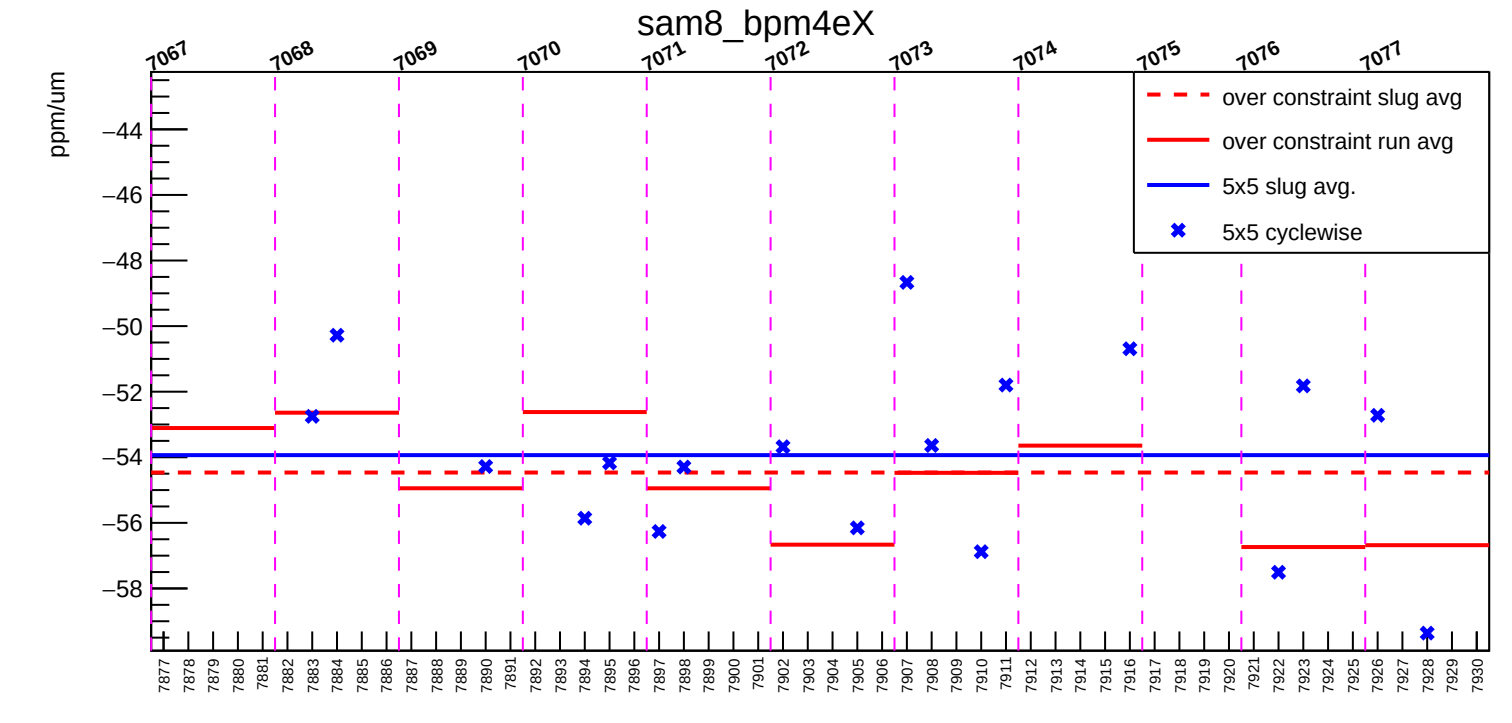
5x5 cyclewise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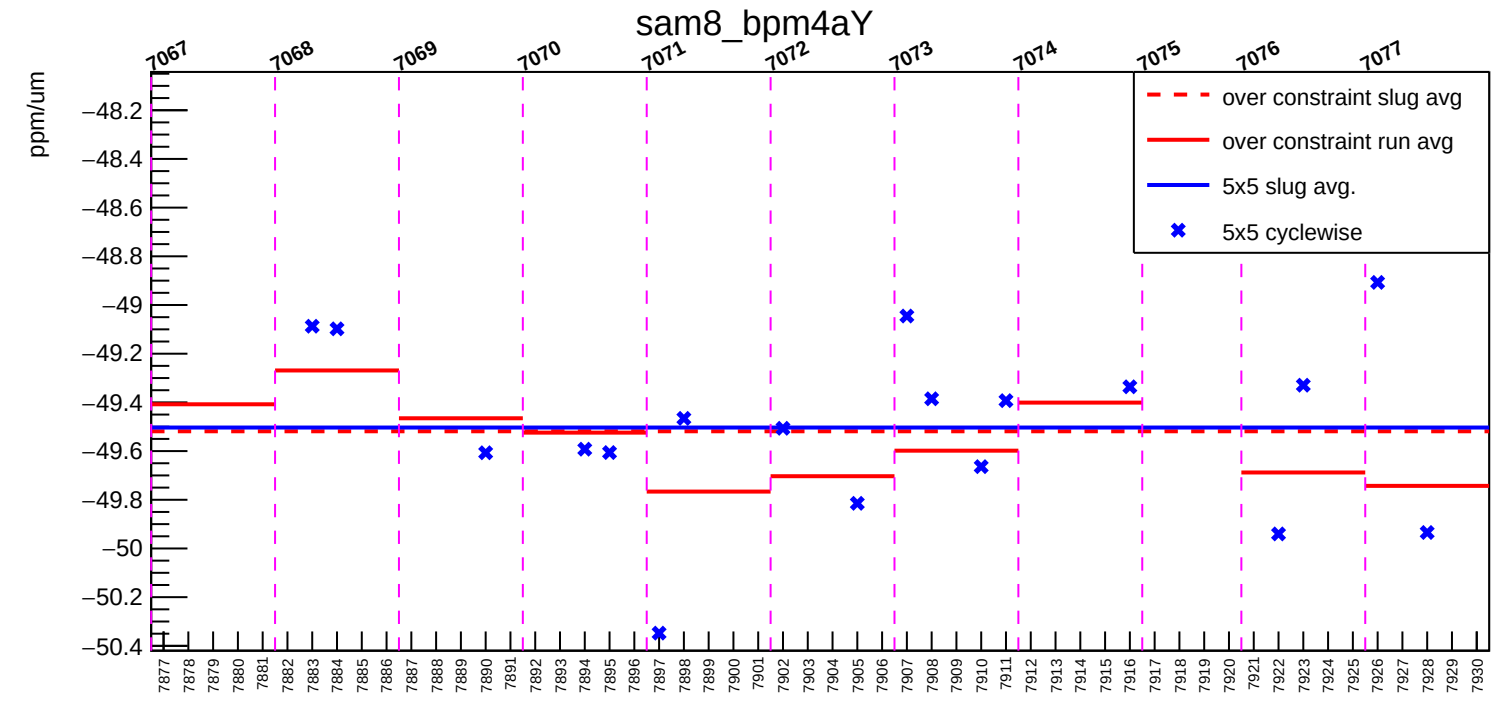
5x5 cyclewise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ppm/um
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−49.4
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over constraint run avg
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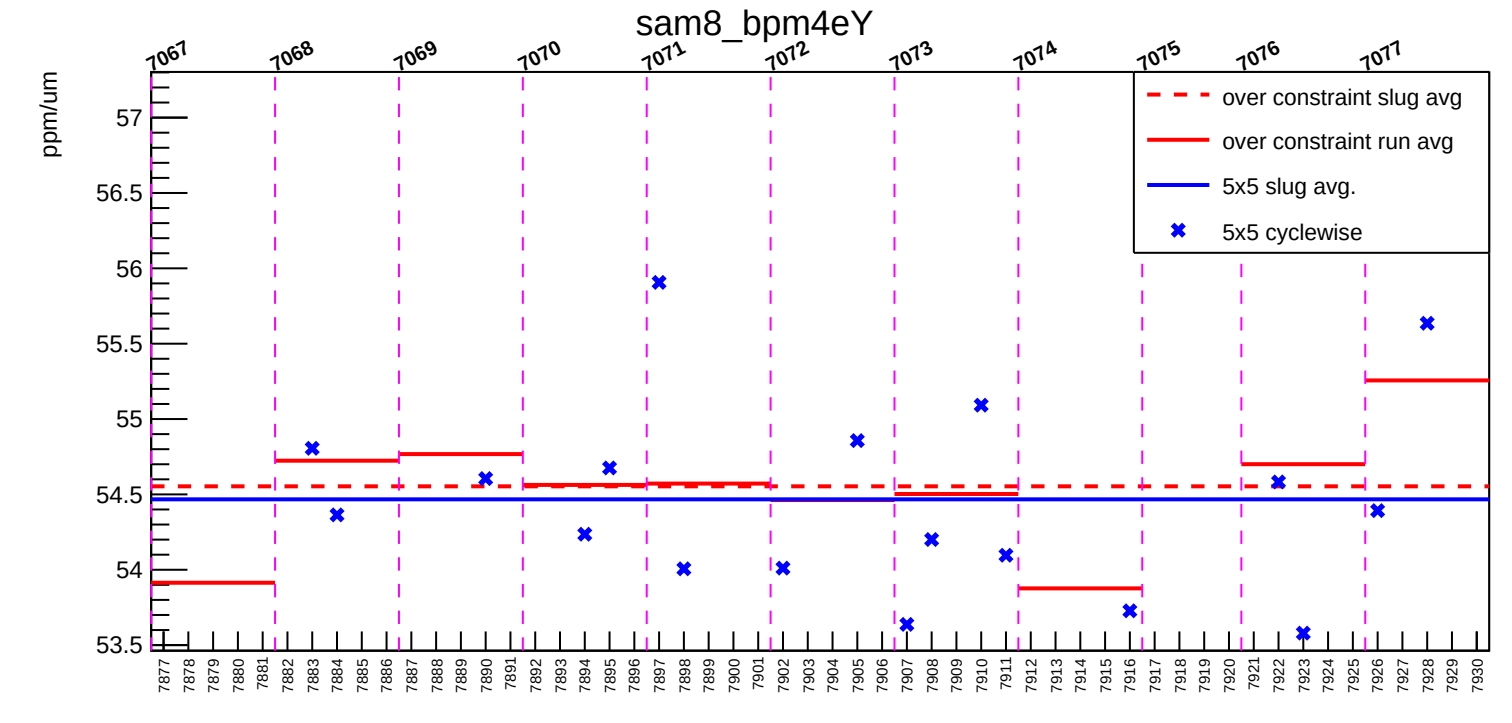
5x5 cyclewise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7077
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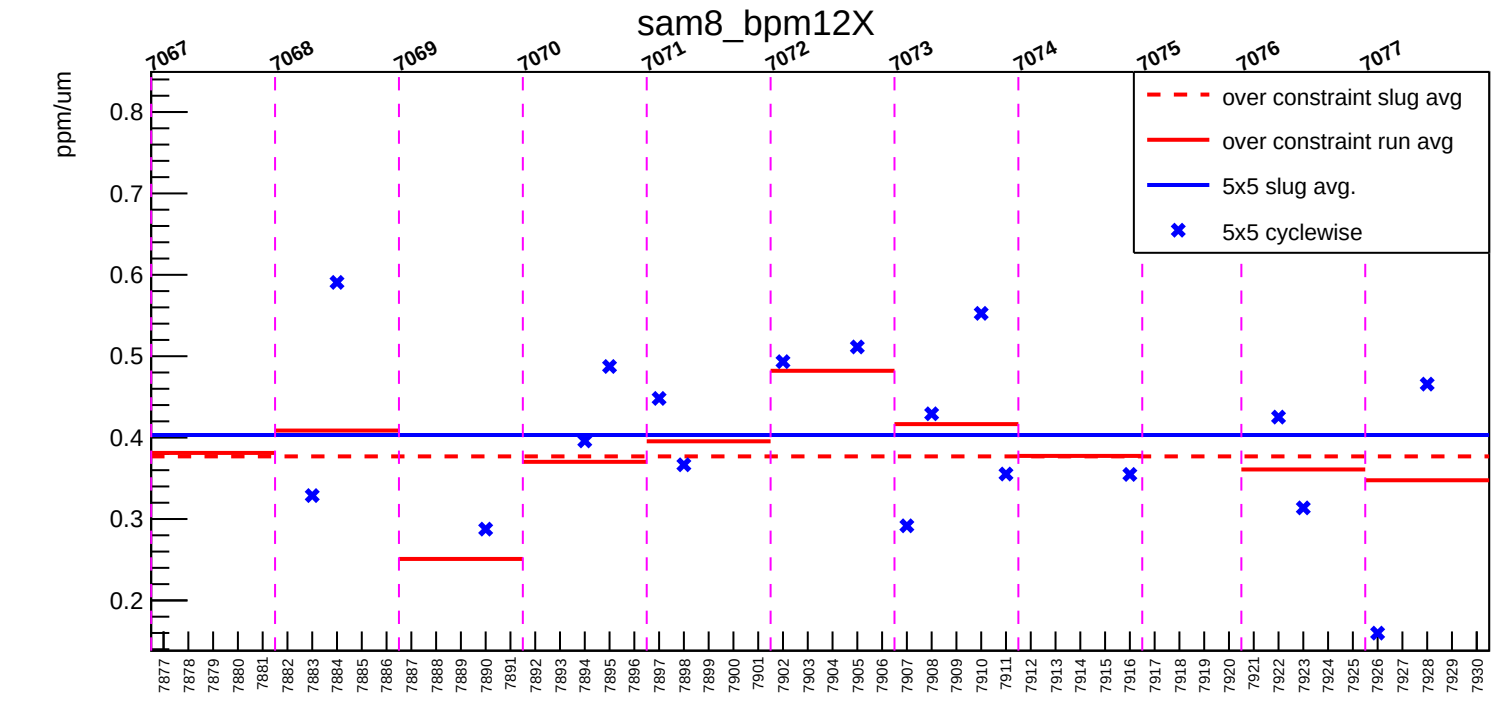
56
55.5
55
54.5
54
53.5
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise


sam8_bpm12X
ppm/um
0.8
0.7
0.6
0.5
0.4
0.3
0.2
7067
7068
7069
7070
7071
7072
7073
7074
7075
7076
7077
over constraint slug avg
over constraint run avg
5x5 slug avg.
5x5 cyclewise
7877 7878 7879 7880 7881 7882 7883 7884 7885 7886 7887 7888 7889 7890 7891 7892 7893 7894 7895 7896 7897 7898 7899 7900 7901 7902 7903 7904 7905 7906 7907 7908 7909 7910 7911 7912 7913 7914 7915 7916 7917 7918 7919 7920 7921 7922 7923 7924 7925 7926 7927 7928 7929 7930