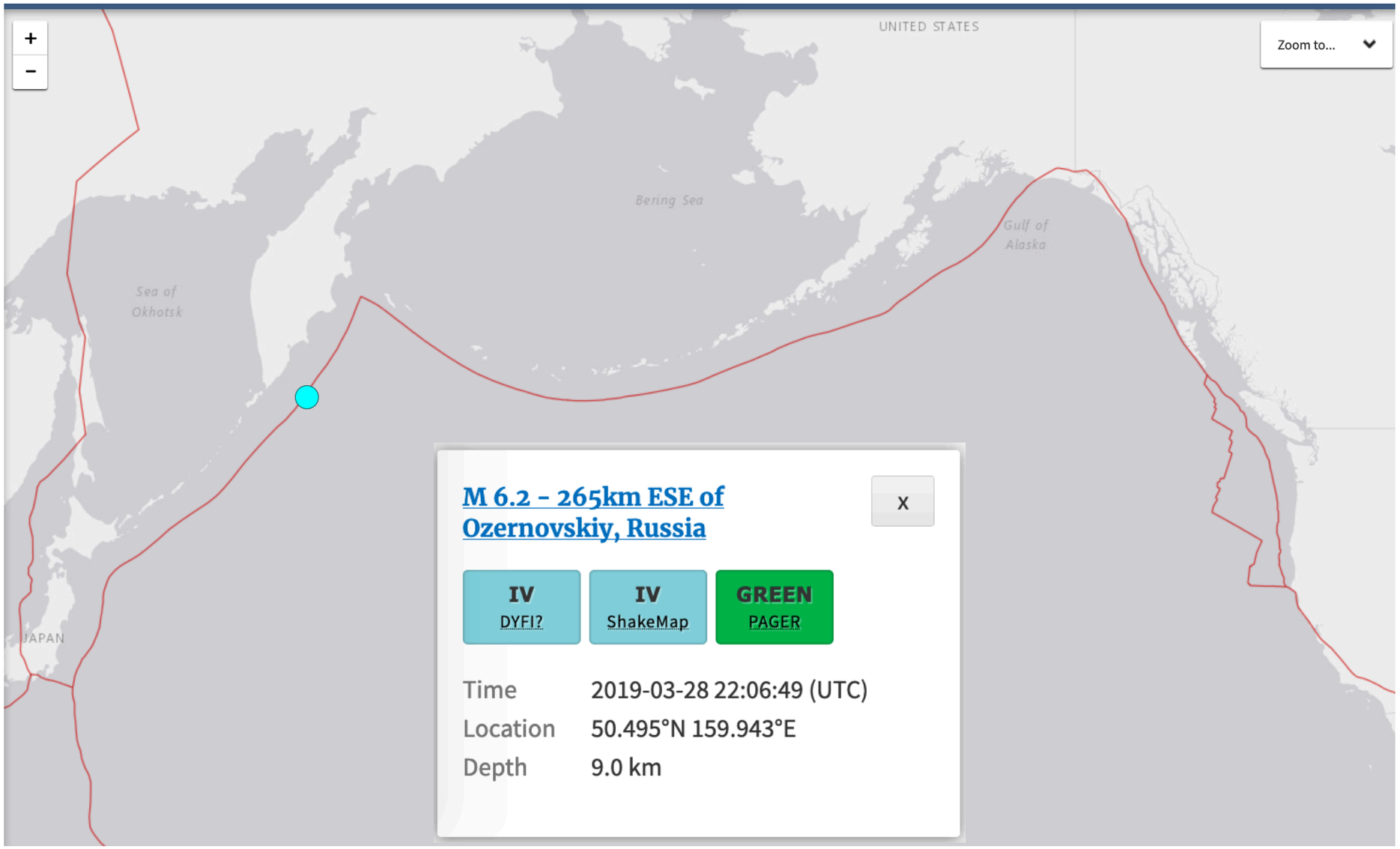
follow up on data from the M6.2 EQ in Russia
28 March, 2019
Brian Lantz, LIGO-G1902038

There is excess motion in the platforms, it seems to be correlated to vertical motion

already have a bunch of plots for this EQ at
https://alog.ligo-la.caltech.edu/SEI/index.php?callRep=1456



info

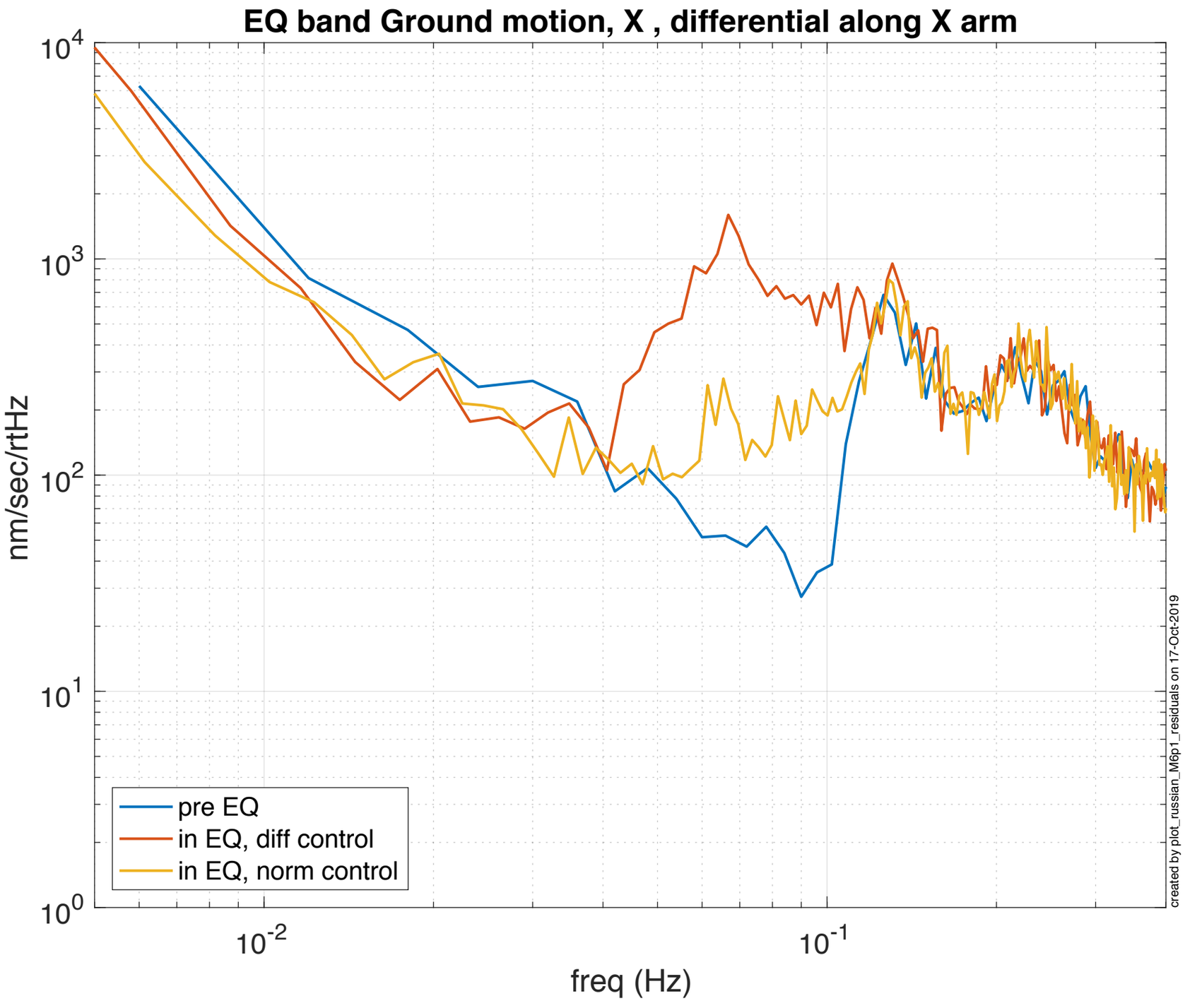
All channels are from LHO

```
% 1     'H1:ISI-GND_STS_ITMY_Z_BLRMS_30M_100M'
% 2     'H1:ISI-GND_STS_ITMY_X_DQ'
% 3     'H1:ISI-GND_STS_ITMY_Y_DQ'
% 4     'H1:ISI-GND_STS_ITMY_Z_DQ'
% 5     'H1:ISI-GND_STS_ETMY_X_DQ'
% 6     'H1:ISI-GND_STS_ETMY_Y_DQ'
% 7     'H1:ISI-GND_STS_ETMY_Z_DQ'
% 8     'H1:ISI-GND_SENSCOR_ETMY_SUPER_Y_OUT_DQ'
% 9      'H1:ISI-ETMY_ST1_SCSUM_CPS_Y_IN_DQ'
% 10     'H1:ISI-ETMY_ST1_SCSUM_CPS_Z_IN_DQ'
% 11     'H1:ISI-ITMY_ST1_SCSUM_CPS_Y_IN_DQ'
% 12     'H1:ISI-ITMY_ST1_SCSUM_CPS_Z_IN_DQ'
% 13     'H1:ISI-ETMX_ST1_SCSUM_CPS_X_IN_DQ'
% 14     'H1:ISI-ETMX_ST1_SCSUM_CPS_Z_IN_DQ'
% 15     'H1:ISI-ITMX_ST1_SCSUM_CPS_X_IN_DQ'
% 16     'H1:ISI-ITMX_ST1_SCSUM_CPS_Z_IN_DQ'
% 17     'H1:ISI-GND_STS_ETMX_X_DQ'
% 18     'H1:ISI-GND_STS_ETMX_Y_DQ'
% 19     'H1:ISI-GND_STS_ETMX_Z_DQ'
% 20     'H1:ISI-ETMX_ST1_BLND_X_T240_CUR_IN1_DQ'
% 21     'H1:ISI-ETMX_ST1_BLND_Y_T240_CUR_IN1_DQ'
% 22     'H1:ISI-ETMX_ST1_BLND_Z_T240_CUR_IN1_DQ'
% 23     'H1:ISI-ETMY_ST1_BLND_X_T240_CUR_IN1_DQ'
% 24     'H1:ISI-ETMY_ST1_BLND_Y_T240_CUR_IN1_DQ'
% 25     'H1:ISI-ETMY_ST1_BLND_Z_T240_CUR_IN1_DQ'
% 26     'H1:ISI-ITMX_ST1_BLND_X_T240_CUR_IN1_DQ'
% 27     'H1:ISI-ITMX_ST1_BLND_Y_T240_CUR_IN1_DQ'
% 28     'H1:ISI-ITMX_ST1_BLND_Z_T240_CUR_IN1_DQ'
% 29     'H1:ISI-ITMY_ST1_BLND_X_T240_CUR_IN1_DQ'
% 30     'H1:ISI-ITMY_ST1_BLND_Y_T240_CUR_IN1_DQ'
% 31     'H1:ISI-ITMY_ST1_BLND_Z_T240_CUR_IN1_DQ'
% 32     'H1:ISI-ETMX_SUSPOINT_ETMX_EUL_L_DQ'
% 33     'H1:ISI-ETMY_SUSPOINT_ETMY_EUL_L_DQ'
% 34     'H1:ISI-ITMX_SUSPOINT_ITMX_EUL_L_DQ'
% 35     'H1:ISI-ITMY_SUSPOINT_ITMY_EUL_L_DQ'
```

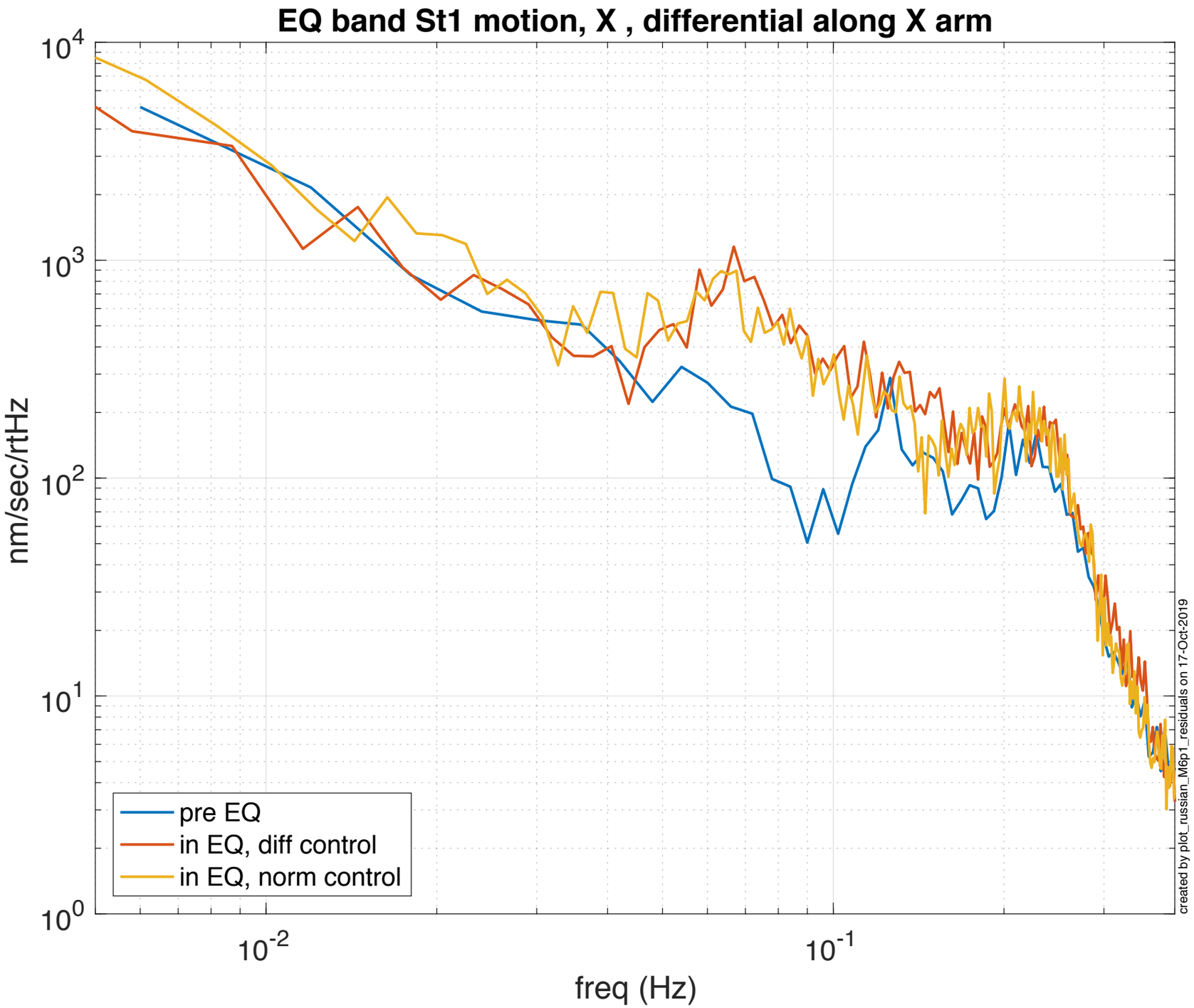
```
% This is how I turned the CPS signals into velocity

function out_struct = velocity(in_struct)
% finds the velocity w/ simple dx/dt.
% input is struct, output is struct
out_struct = in_struct;
dT = 1/out_struct.data.fs;
tmp = 1/ dT * diff(in_struct.data.downsampled_x);
out_struct.data.downsampled_x = [tmp, tmp(end)];
tmp = 1/ dT * diff(in_struct.data.EQx);
out_struct.data.EQx = [tmp, tmp(end)];
end
```

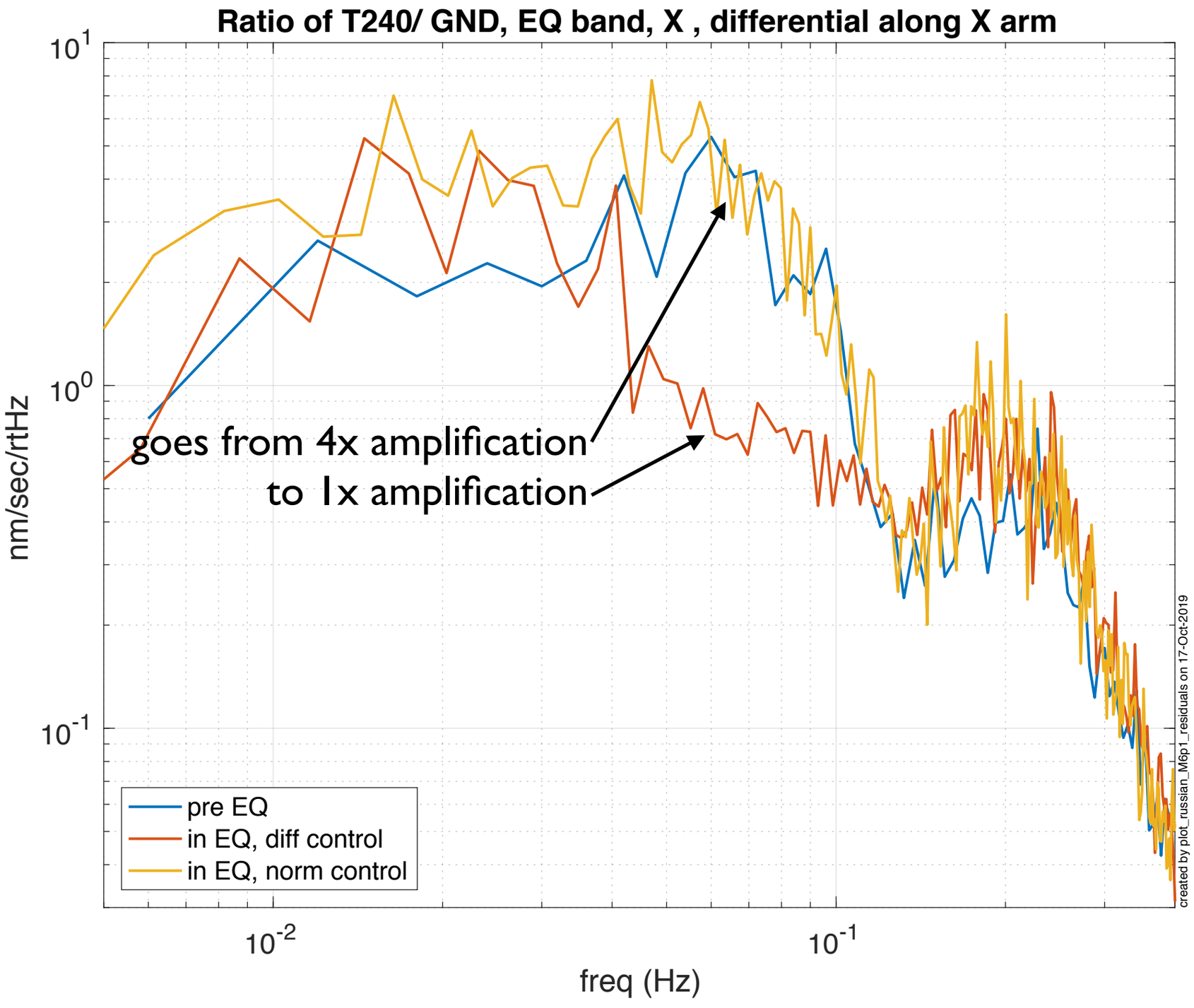
Differential isolation perf. mediocre



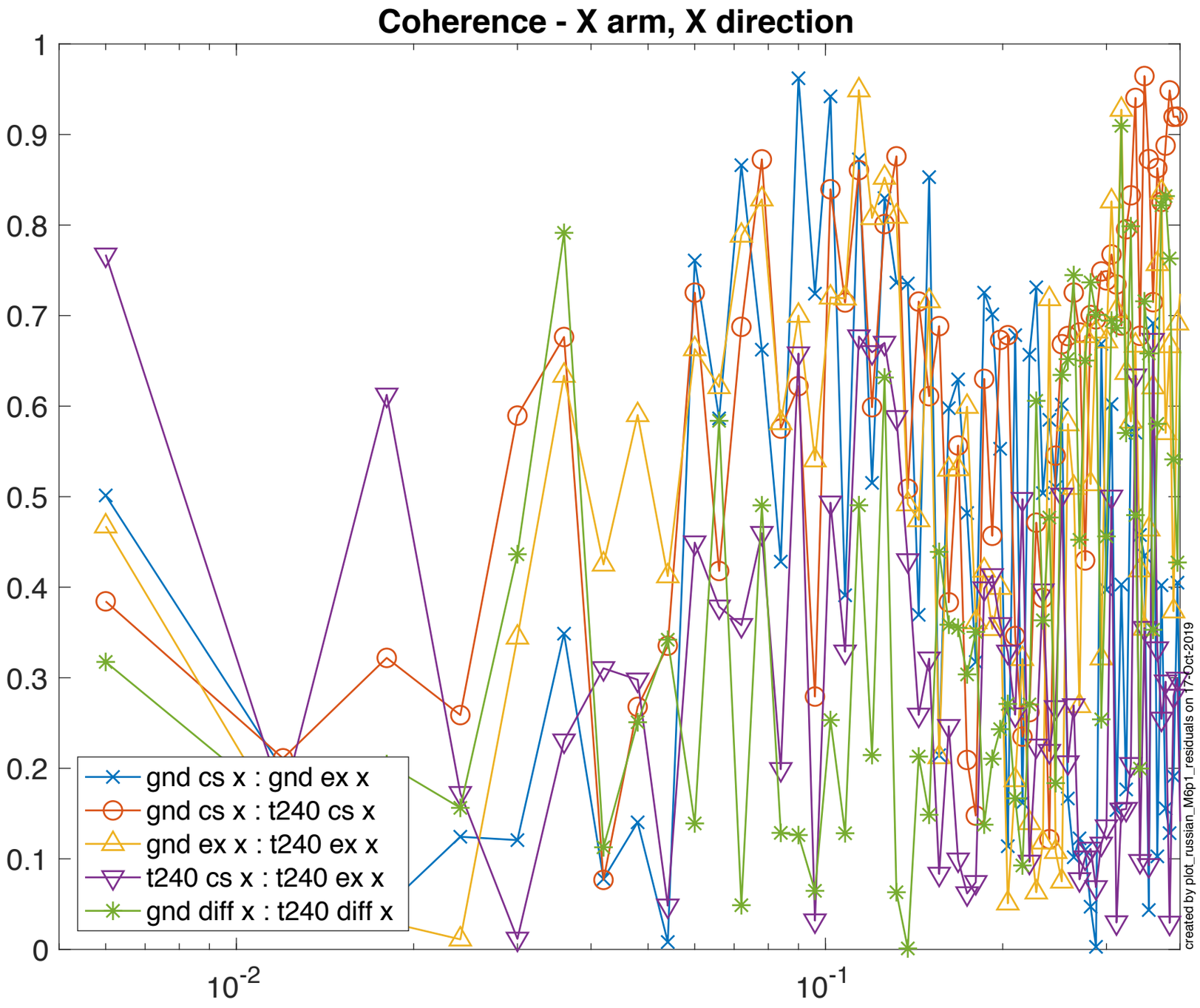
Differential isolation perf. mediocre



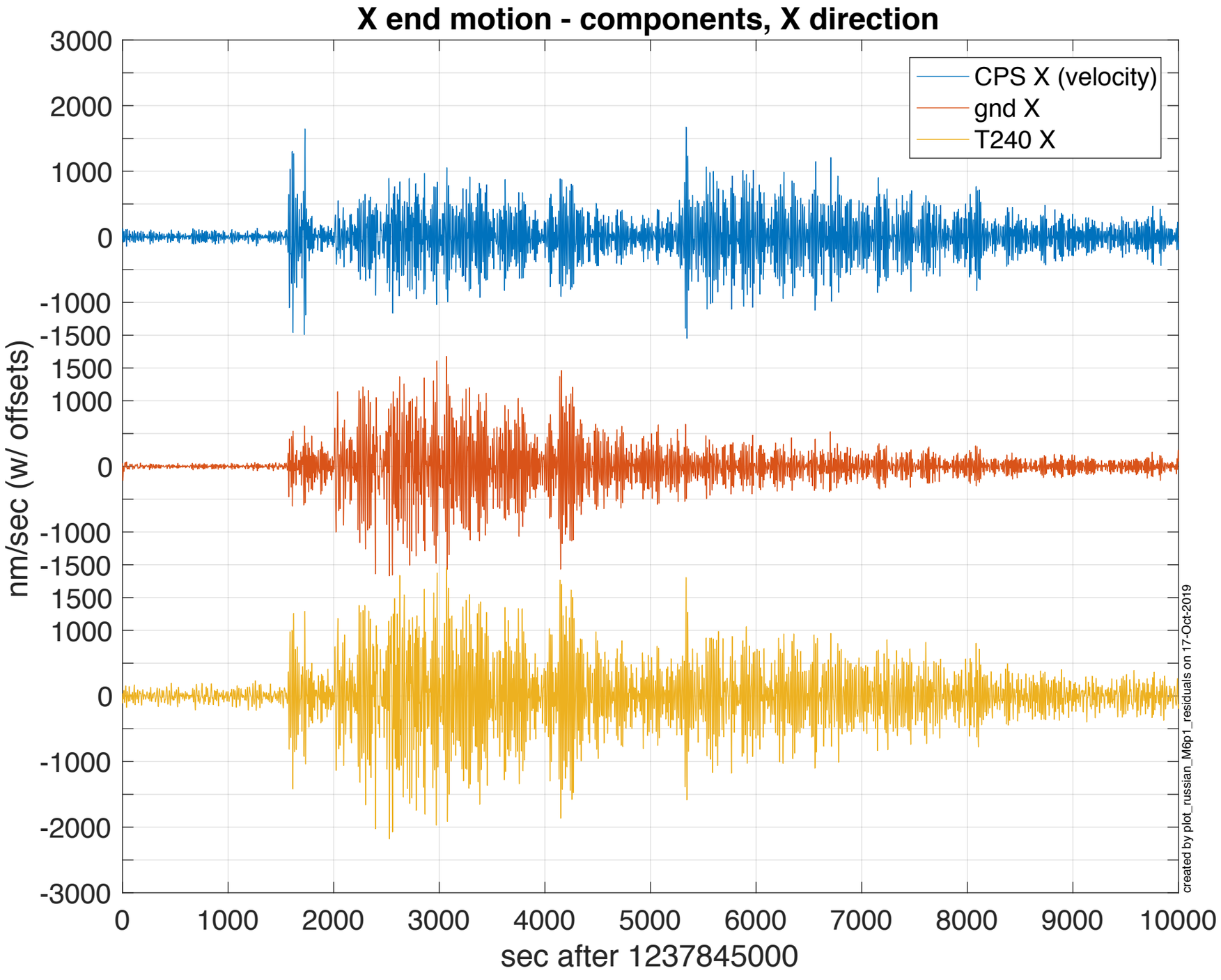
Differential isolation perf. mediocre



The motion isn't very coherent



Excess motion on the tables (End-X)



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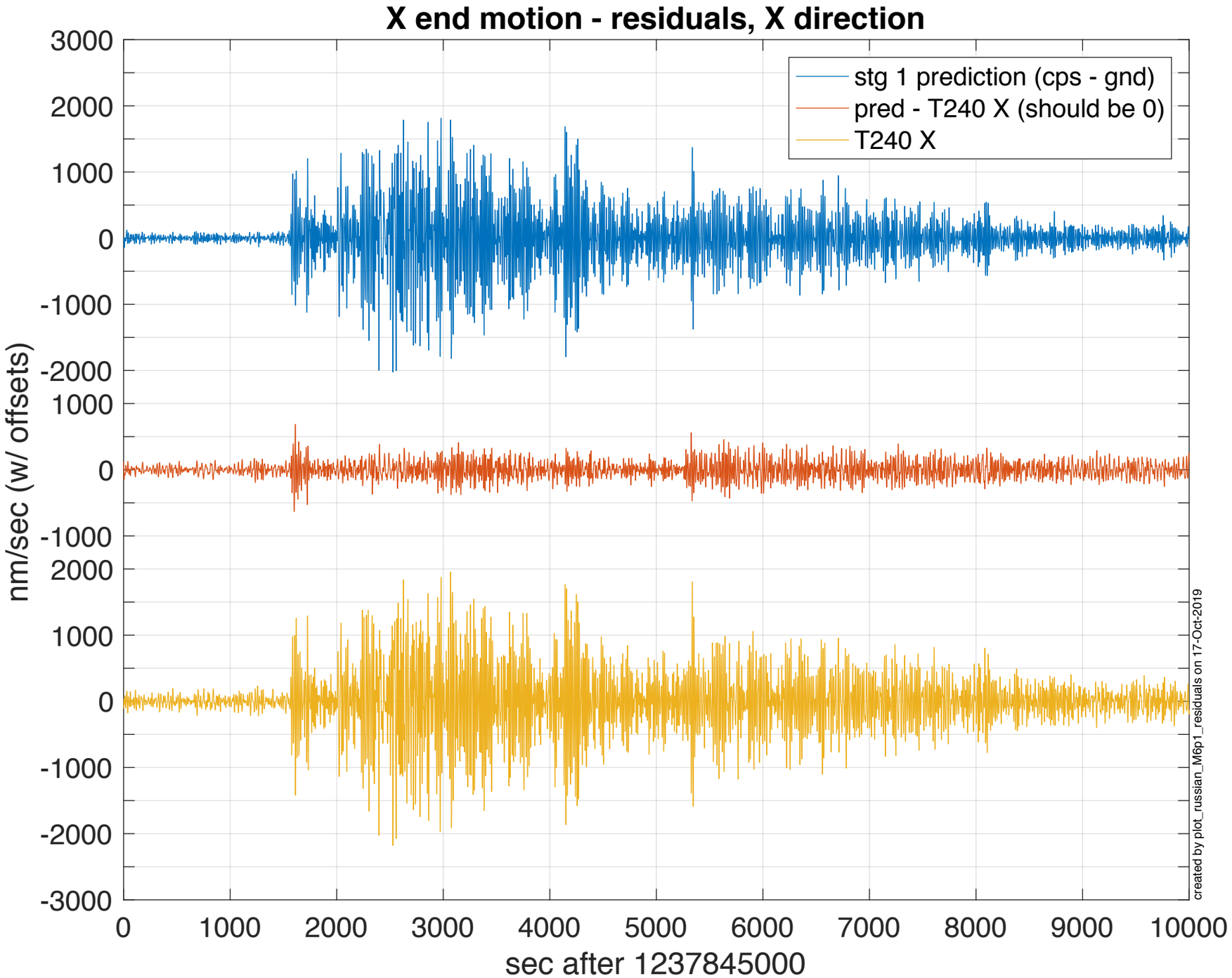
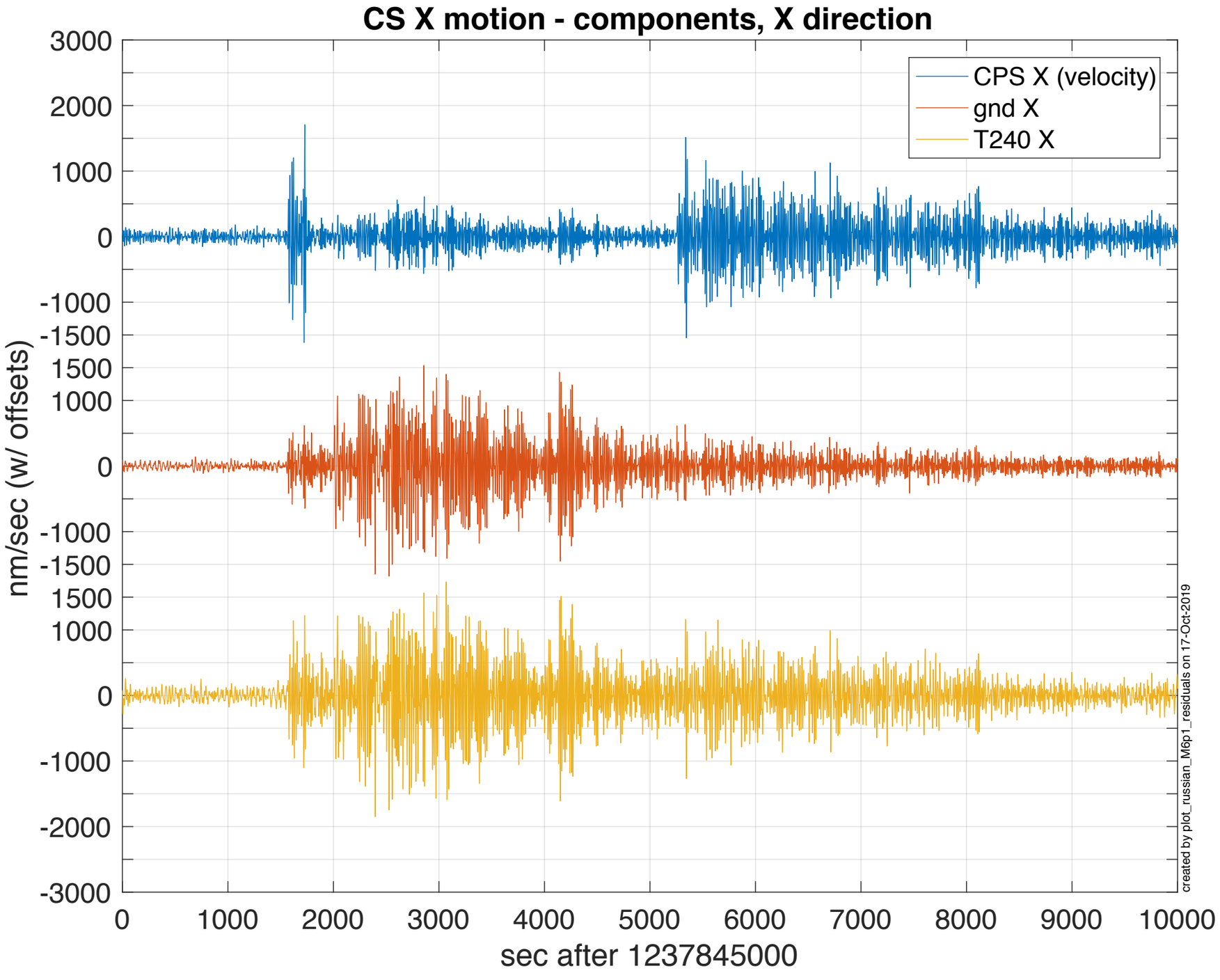
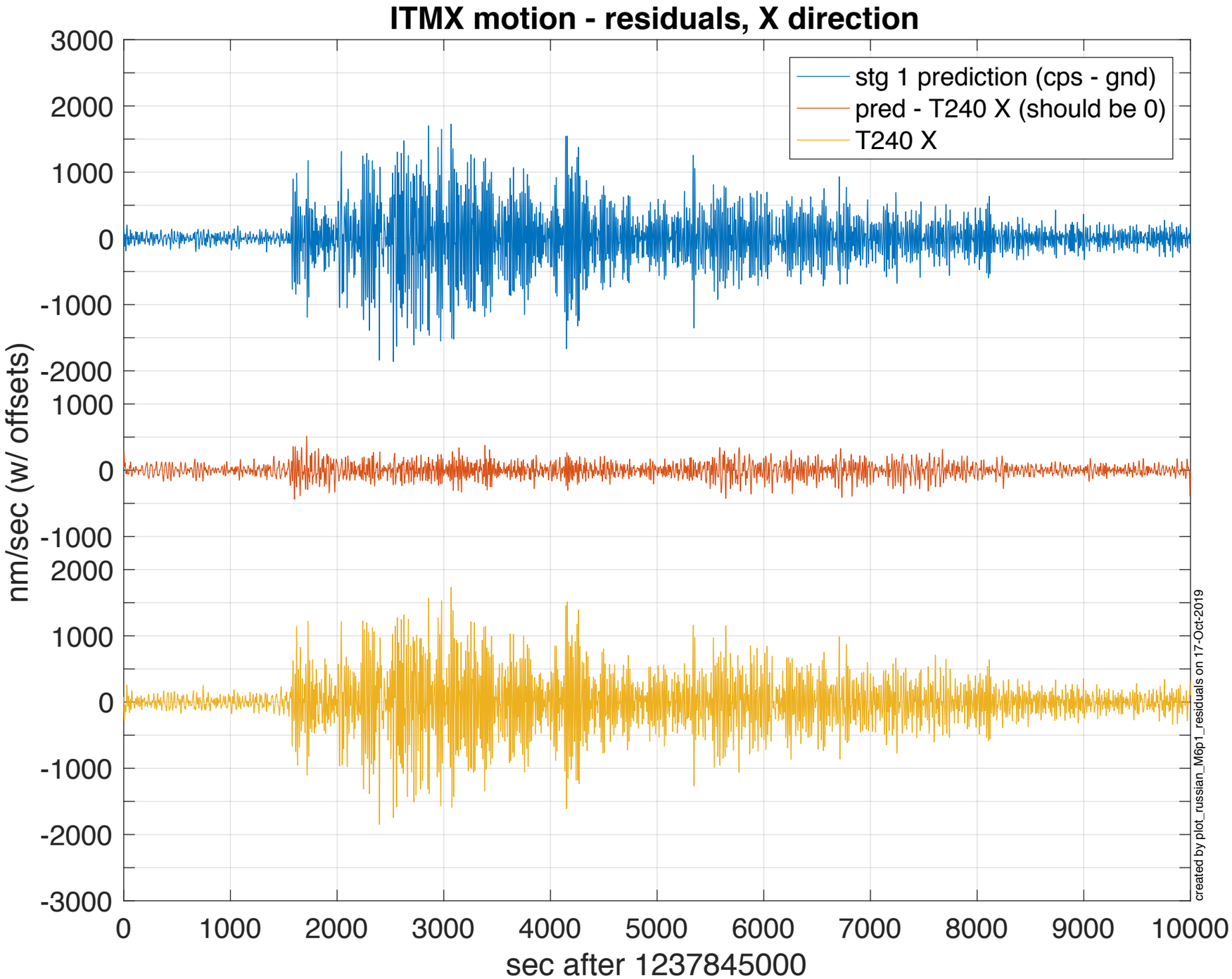


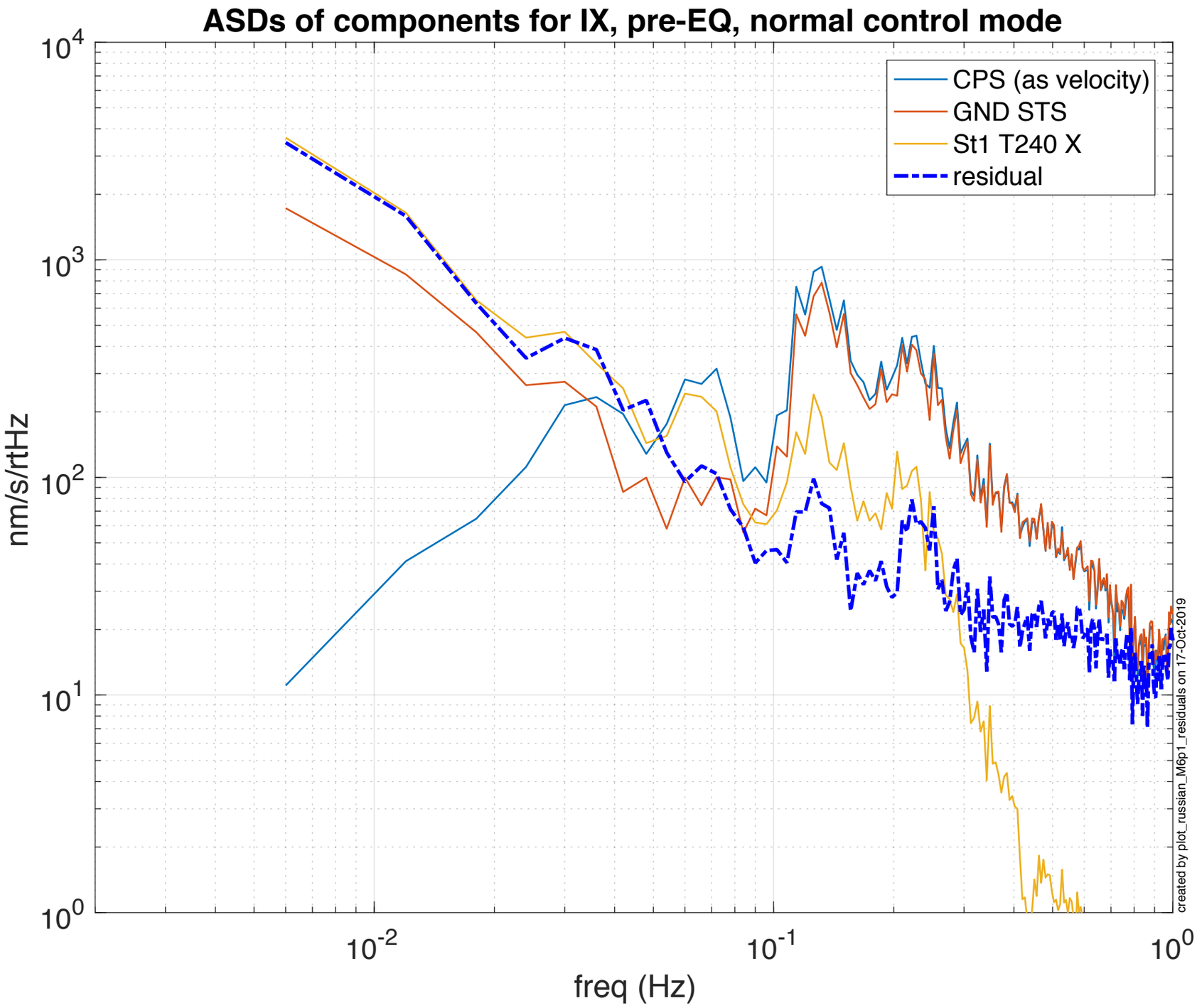
Excess motion on the tables (In-X)



Excess motion on the tables (In-X)

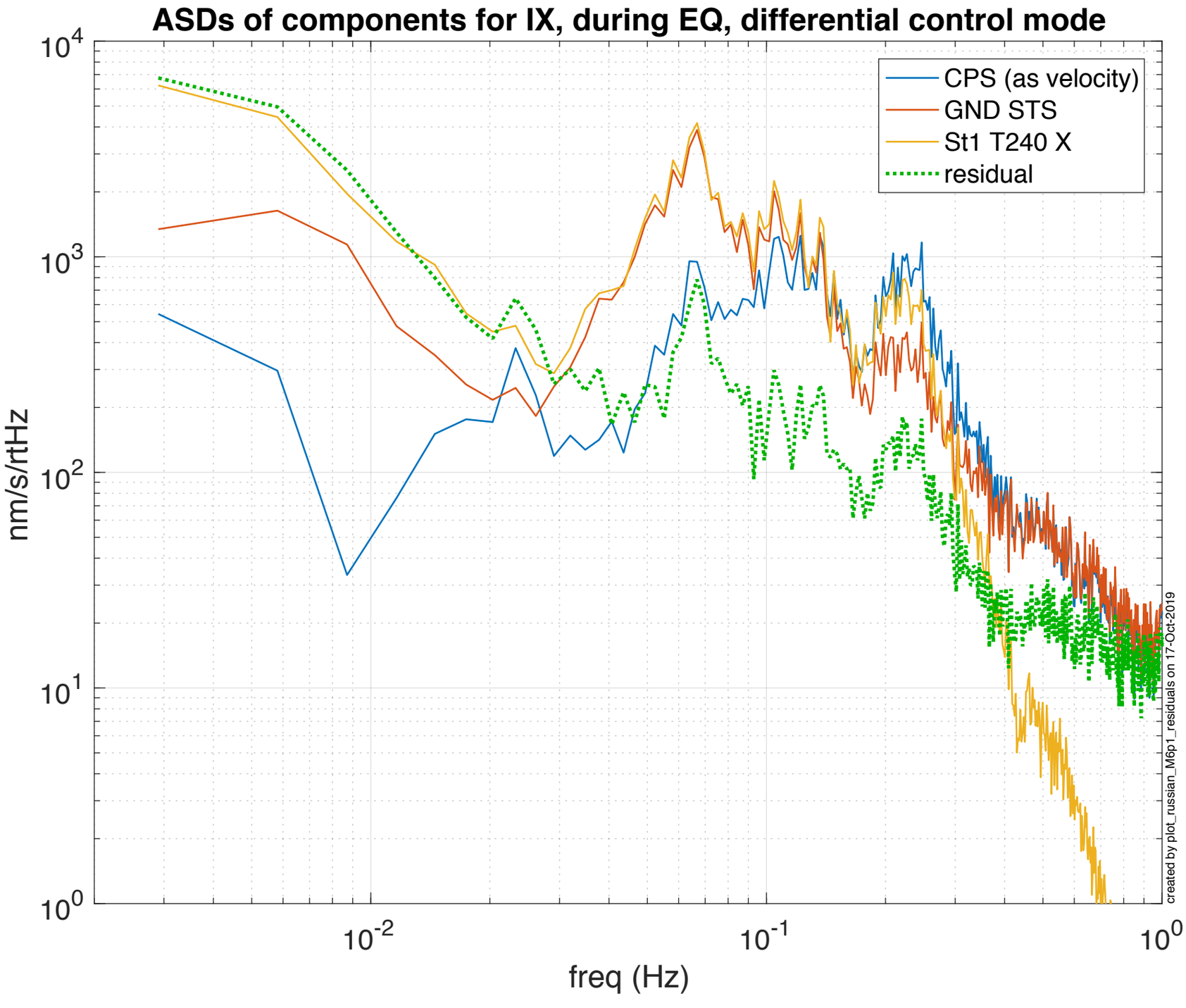


Plot residuals (In-X)



I don't see a clear pattern in these, maybe you can?

Plot residuals (In-X)



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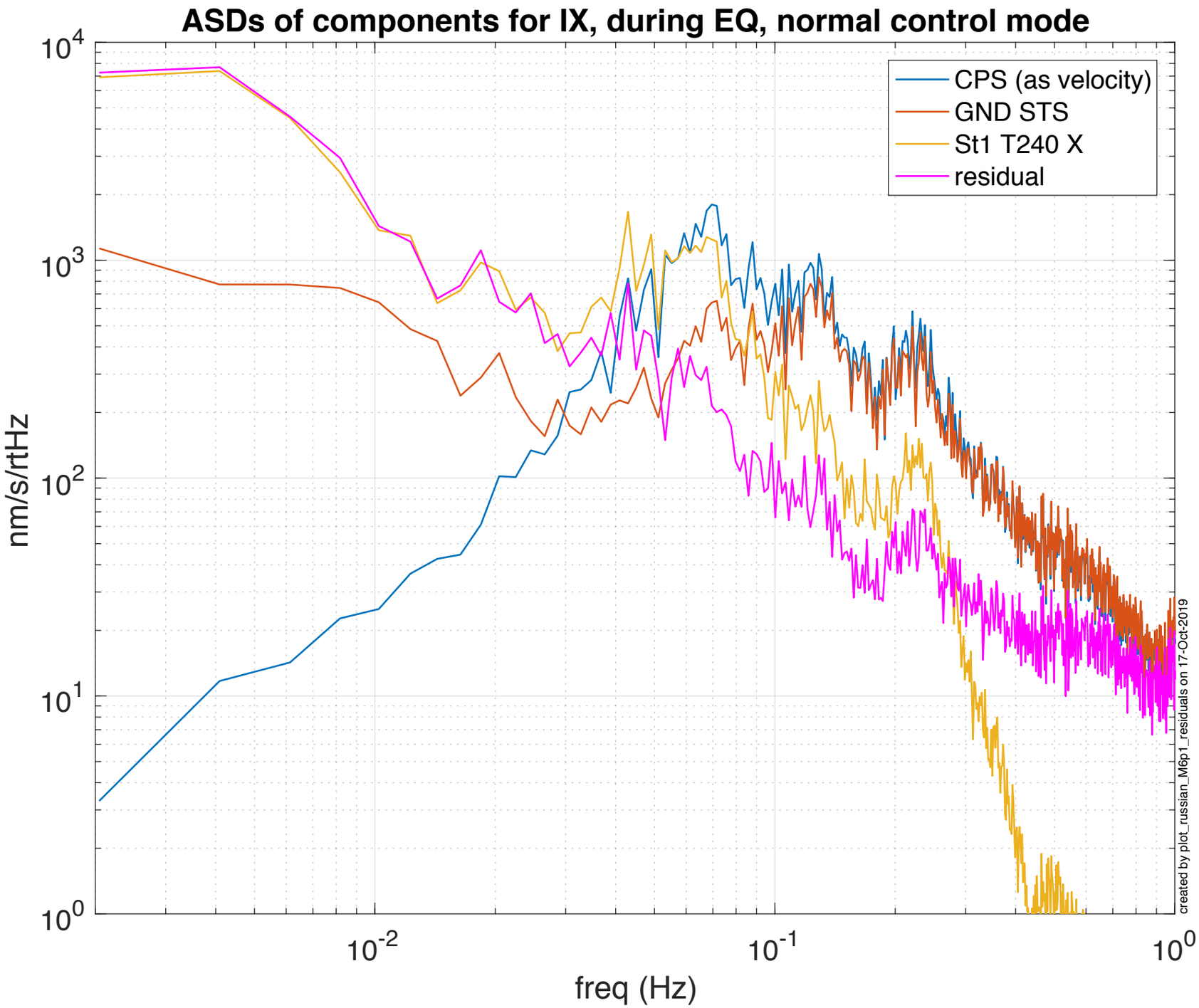

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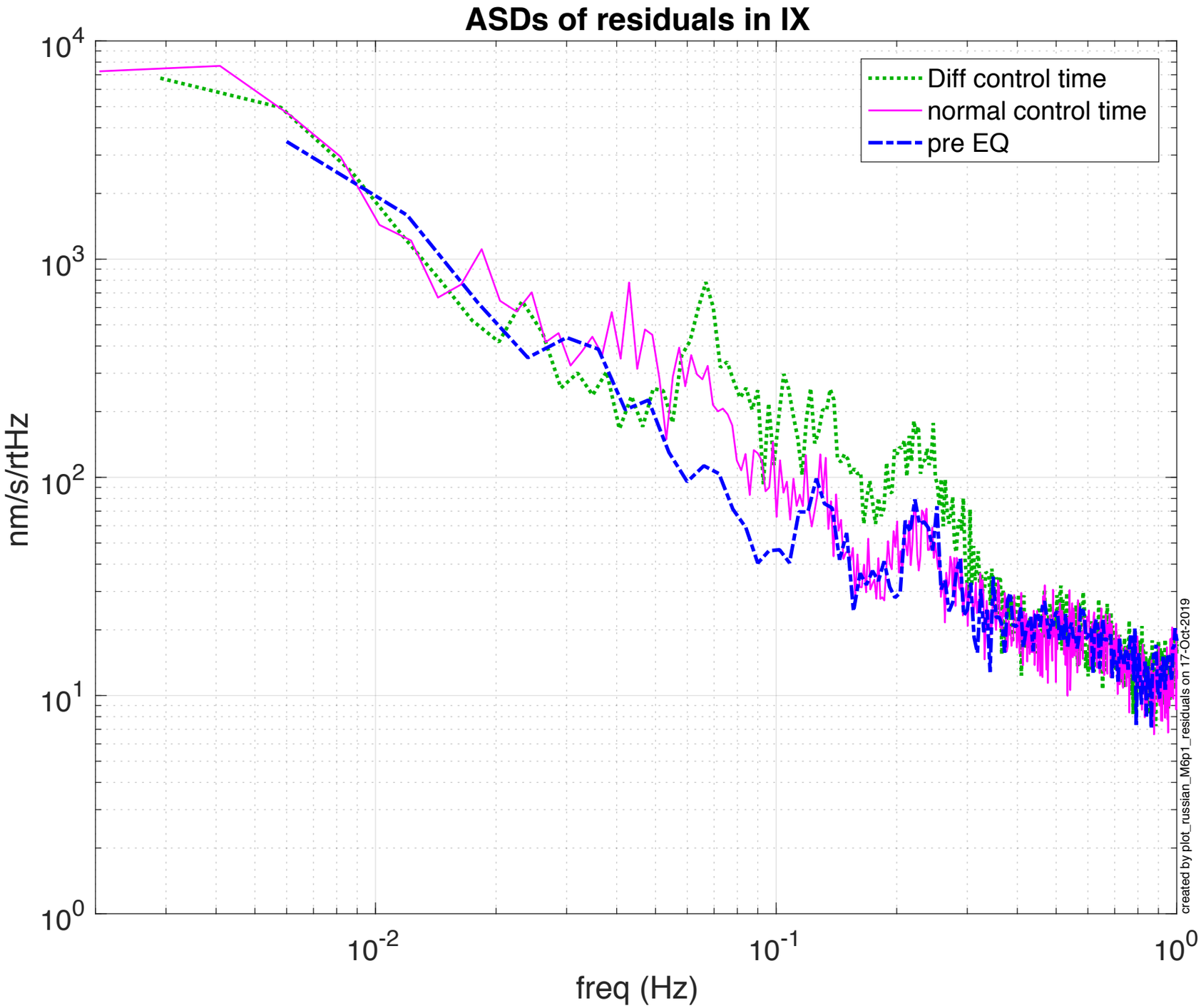
compare residuals (In-X)



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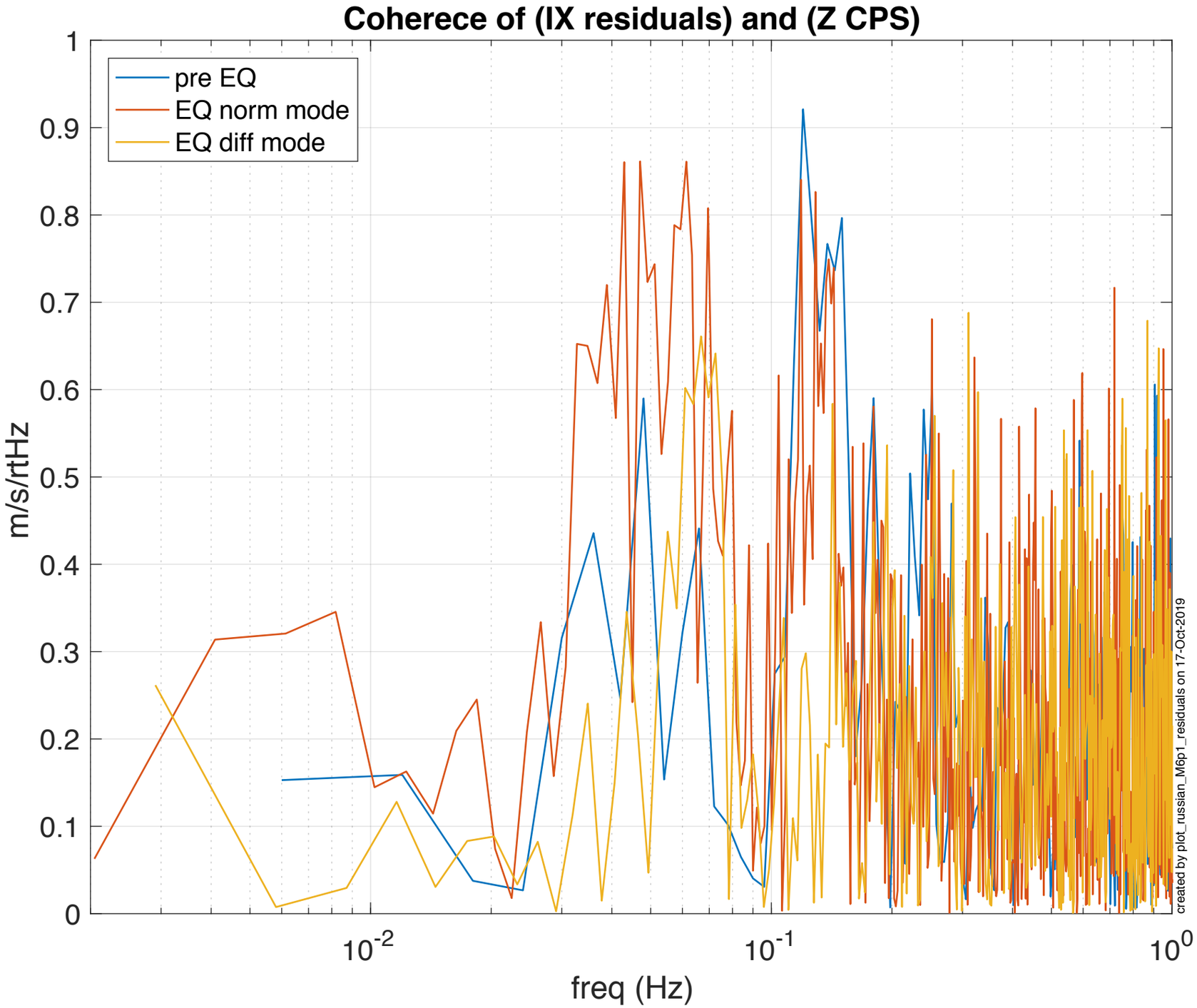
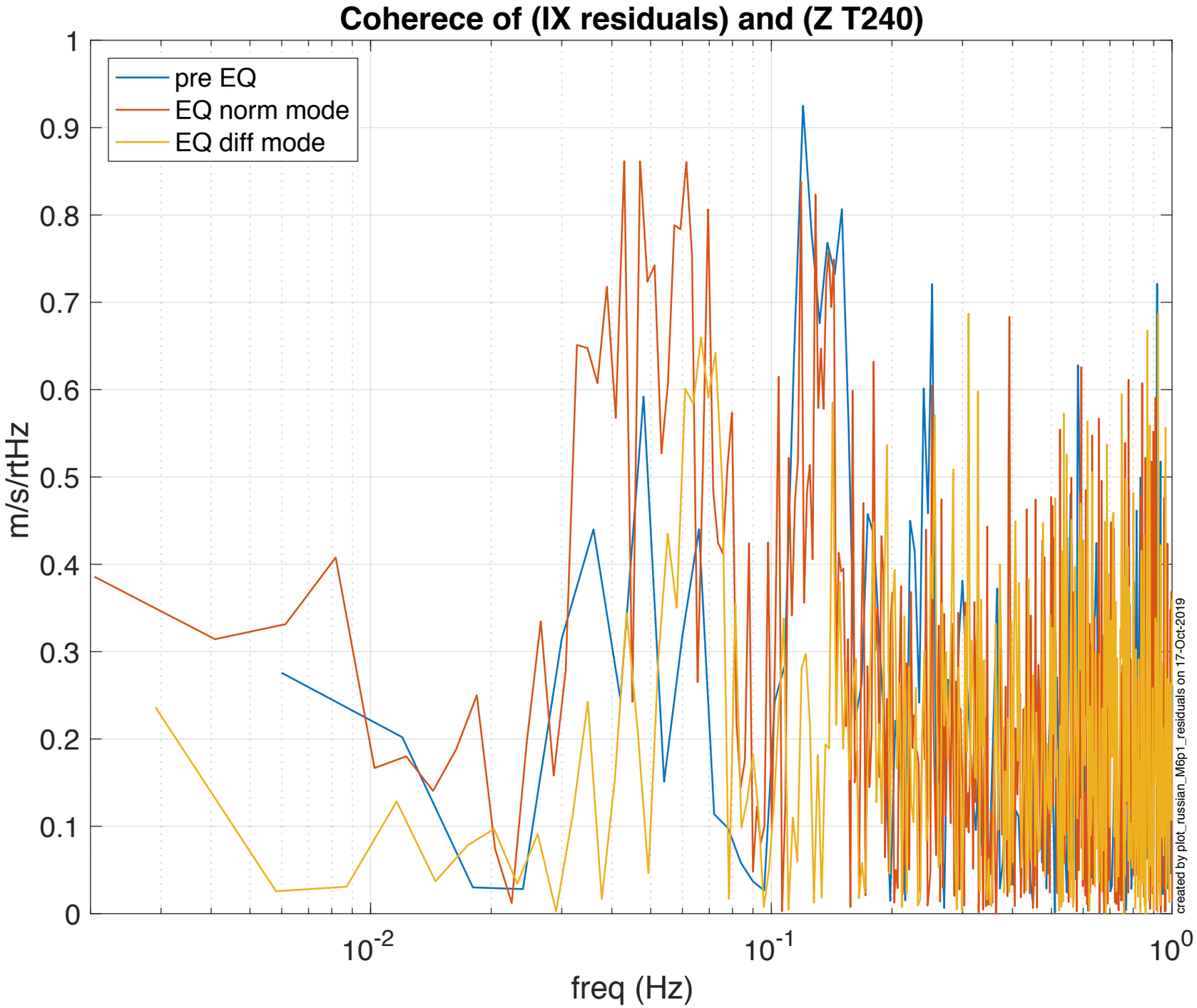
the residual is coh. w/ Z motion

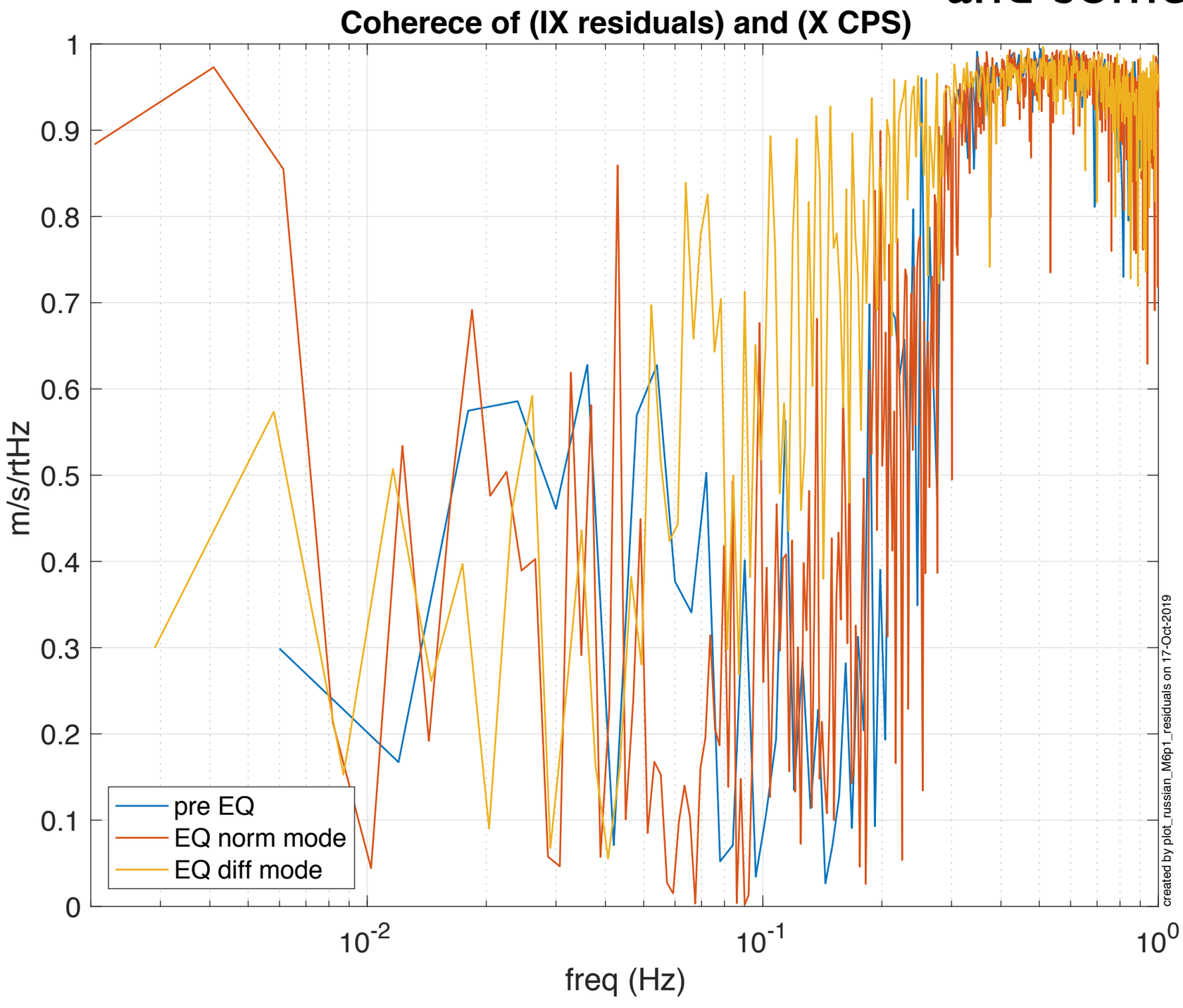


the residual is coh. w/ Z motion

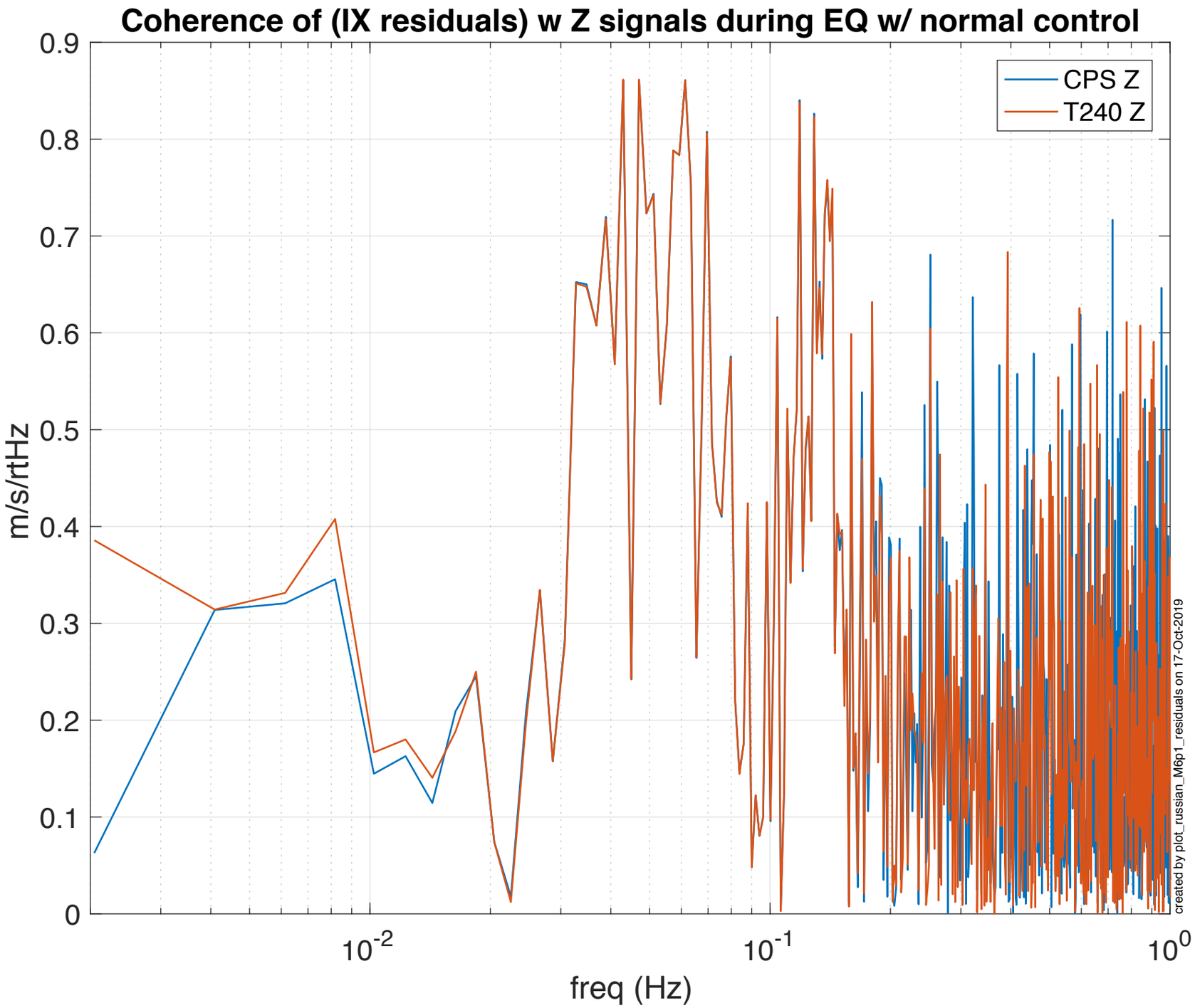


the residual is coh. w/ Z motion

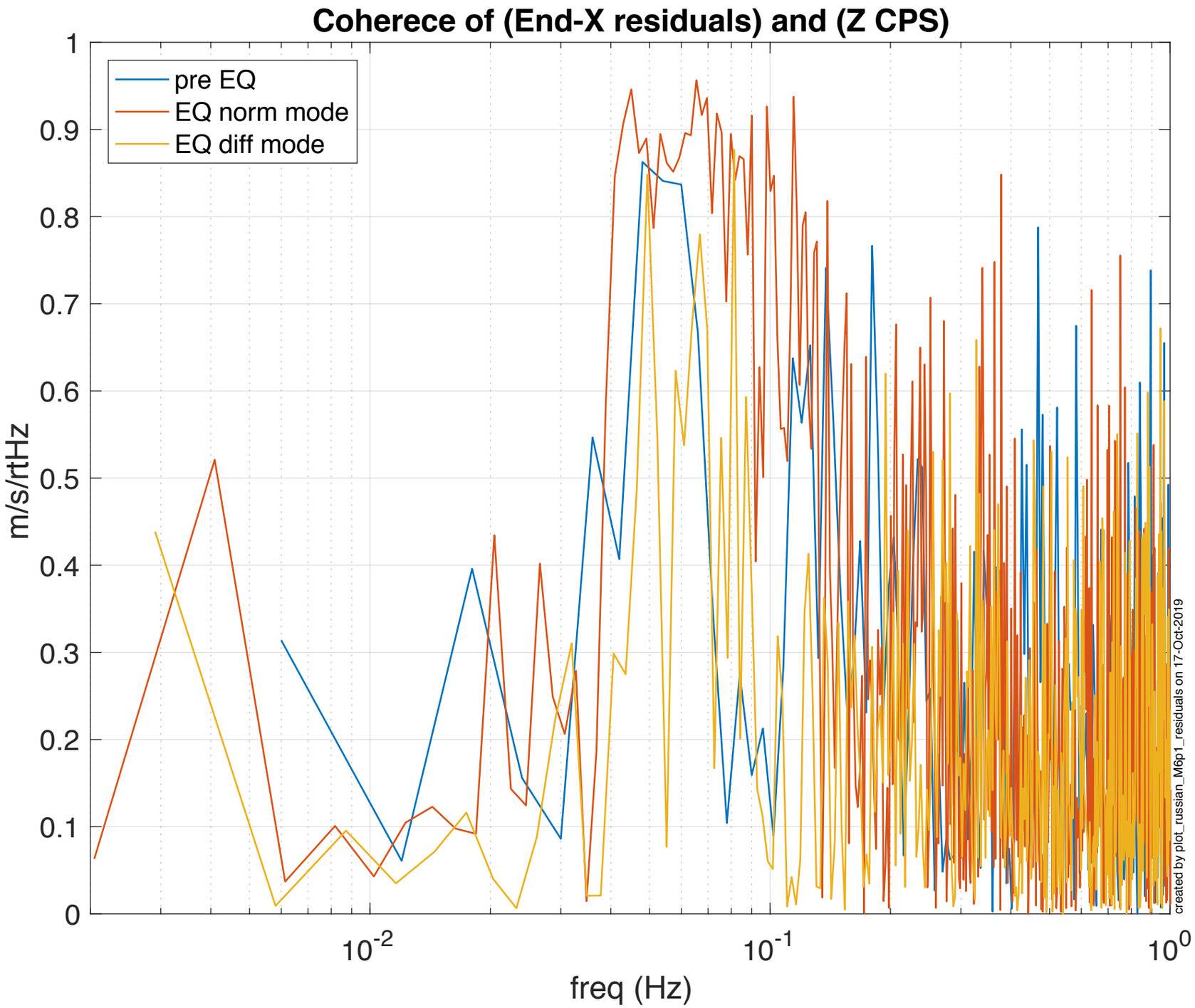
and some w/ X



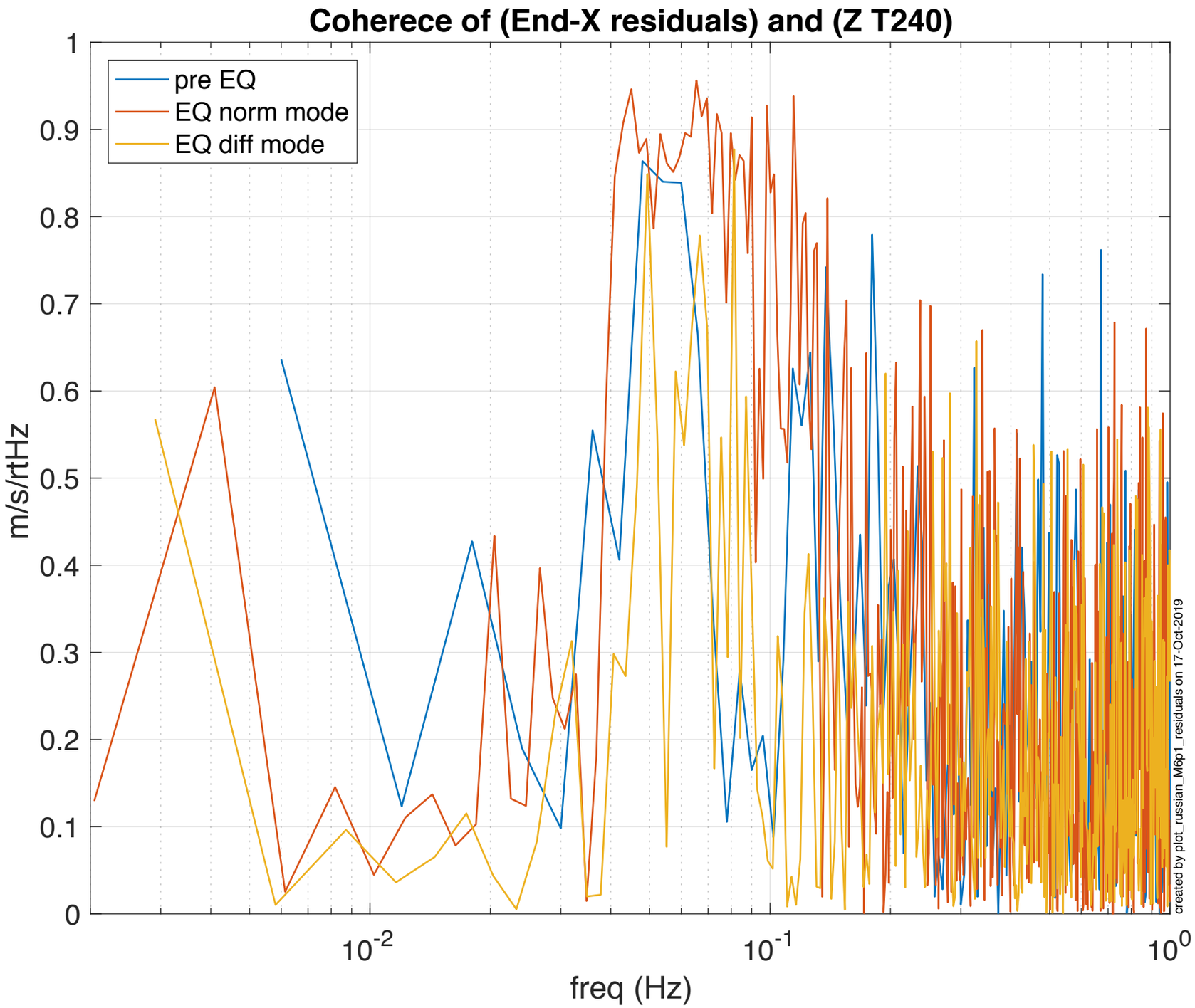
why do T240 & CPS residuals match?



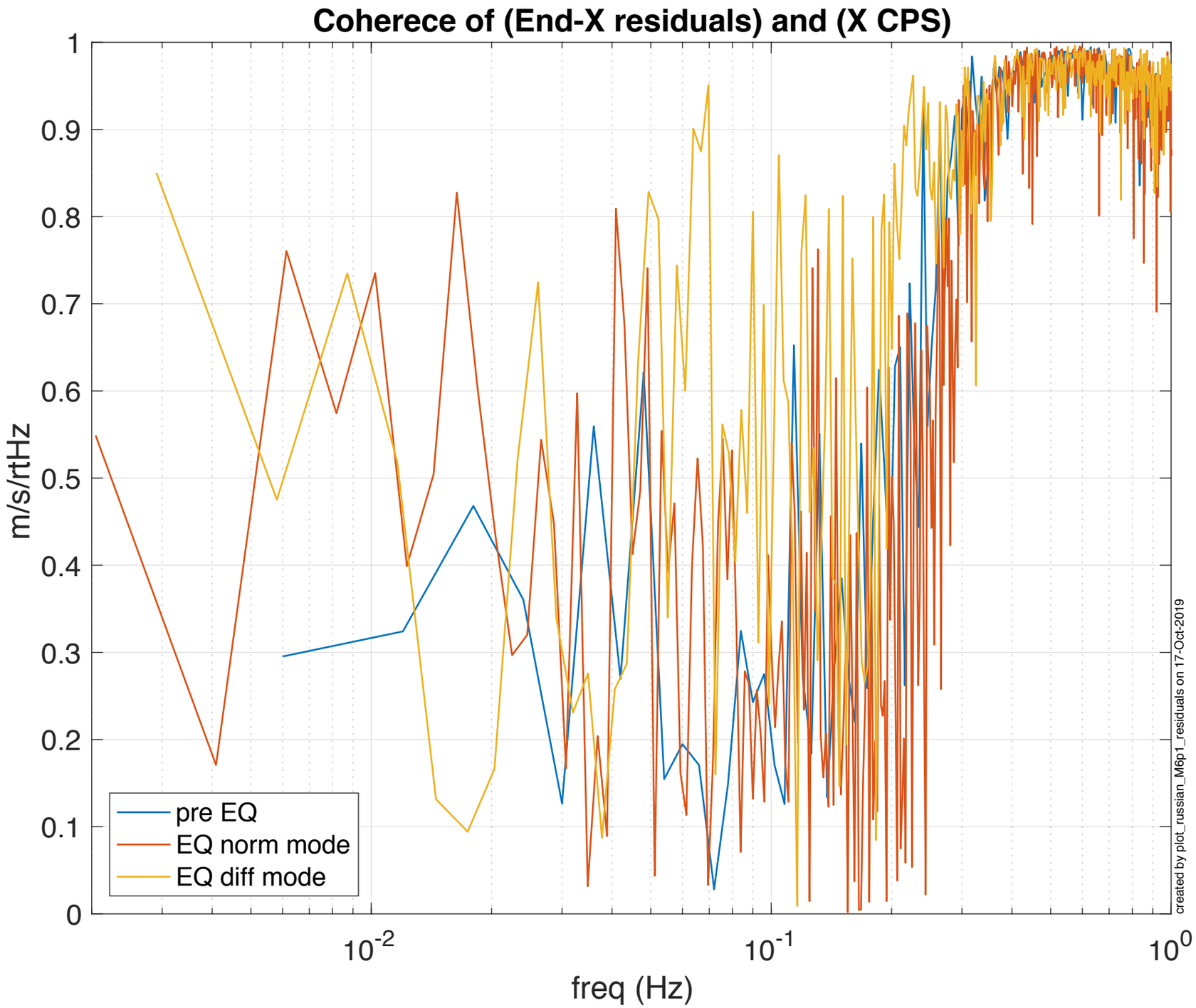
True at End-X as well



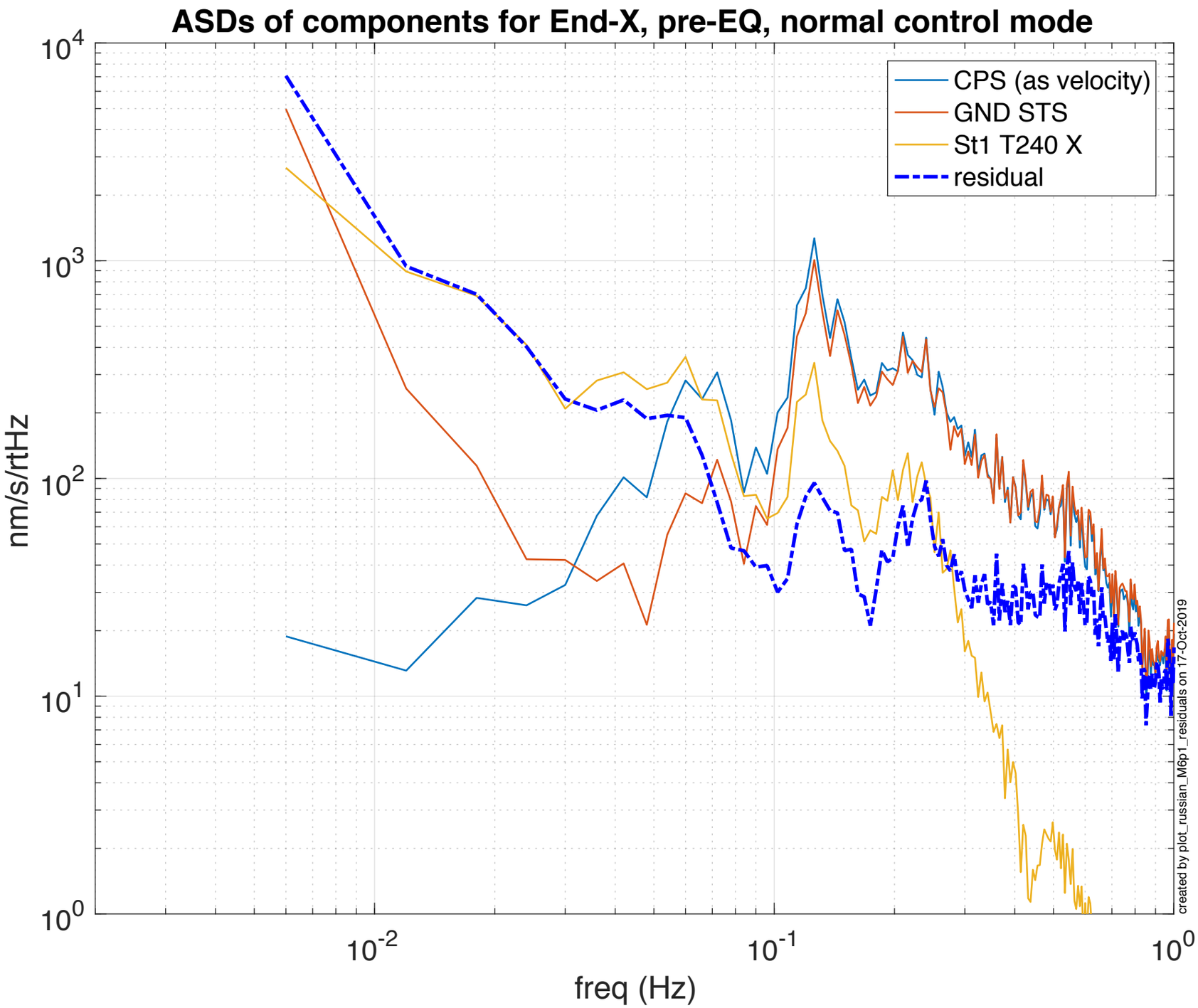
True at End-X as well



True at End-X as well



Plot residuals (End-X)



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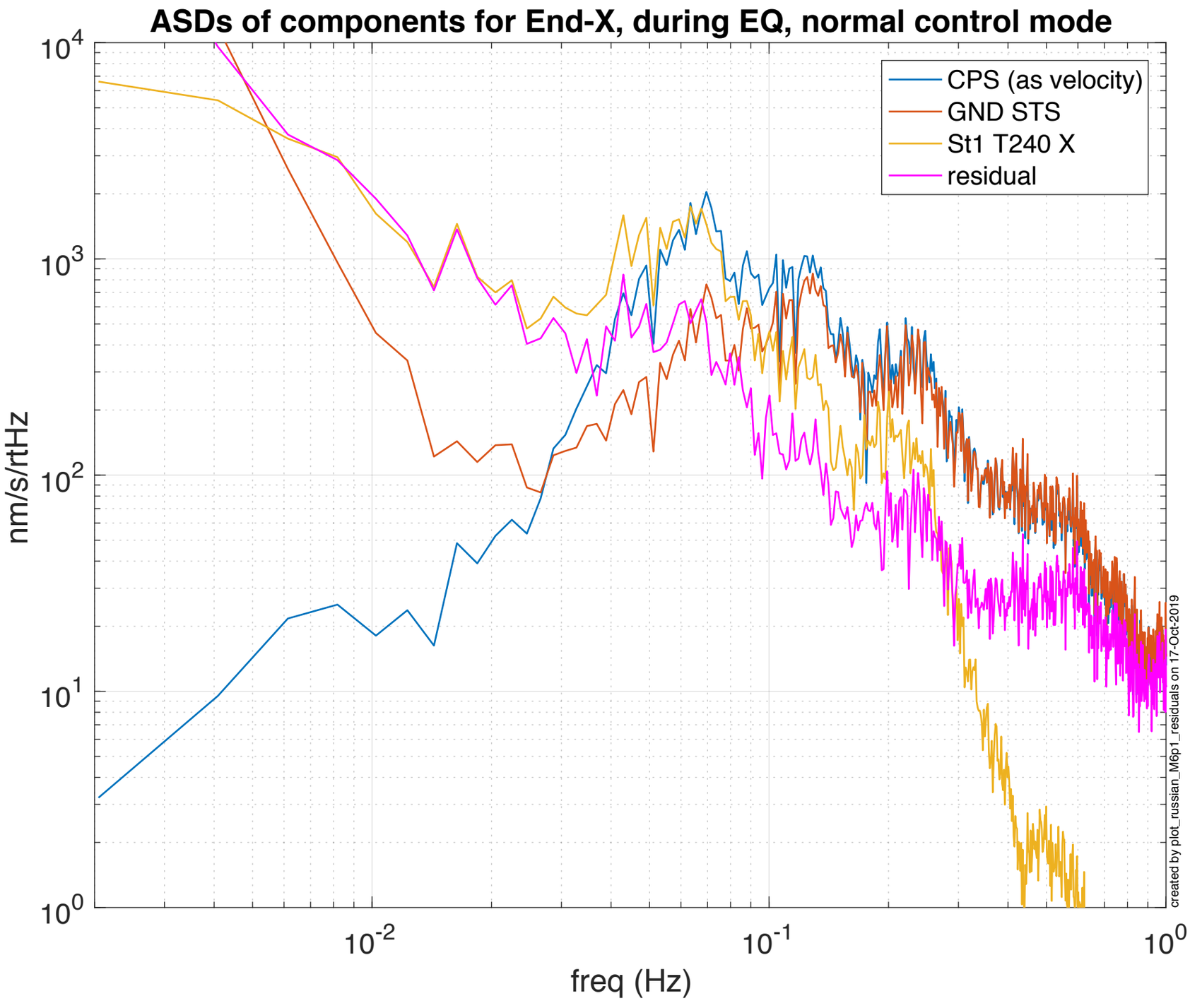
Plot residuals (End-X)



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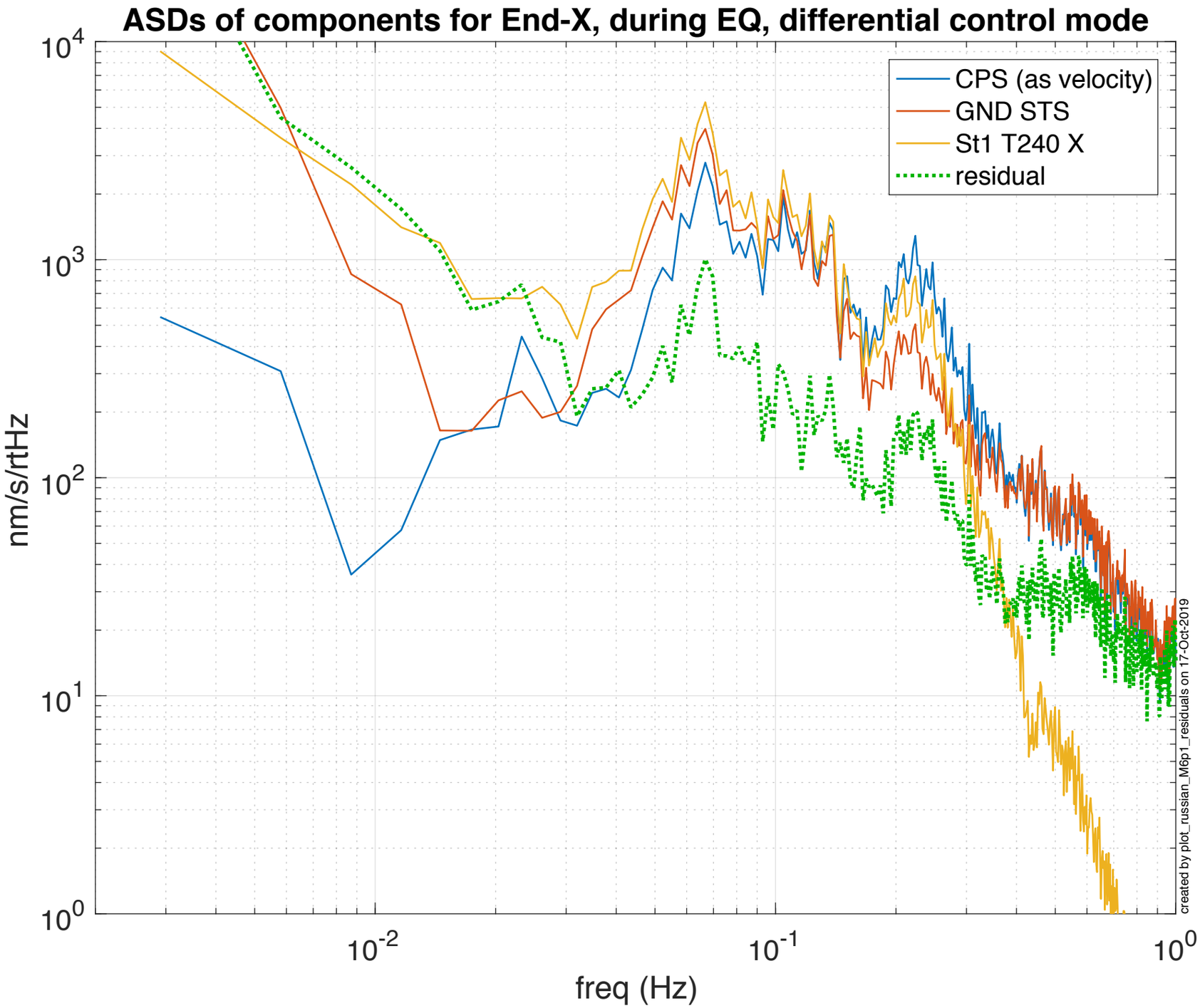
Plot residuals (End-X)



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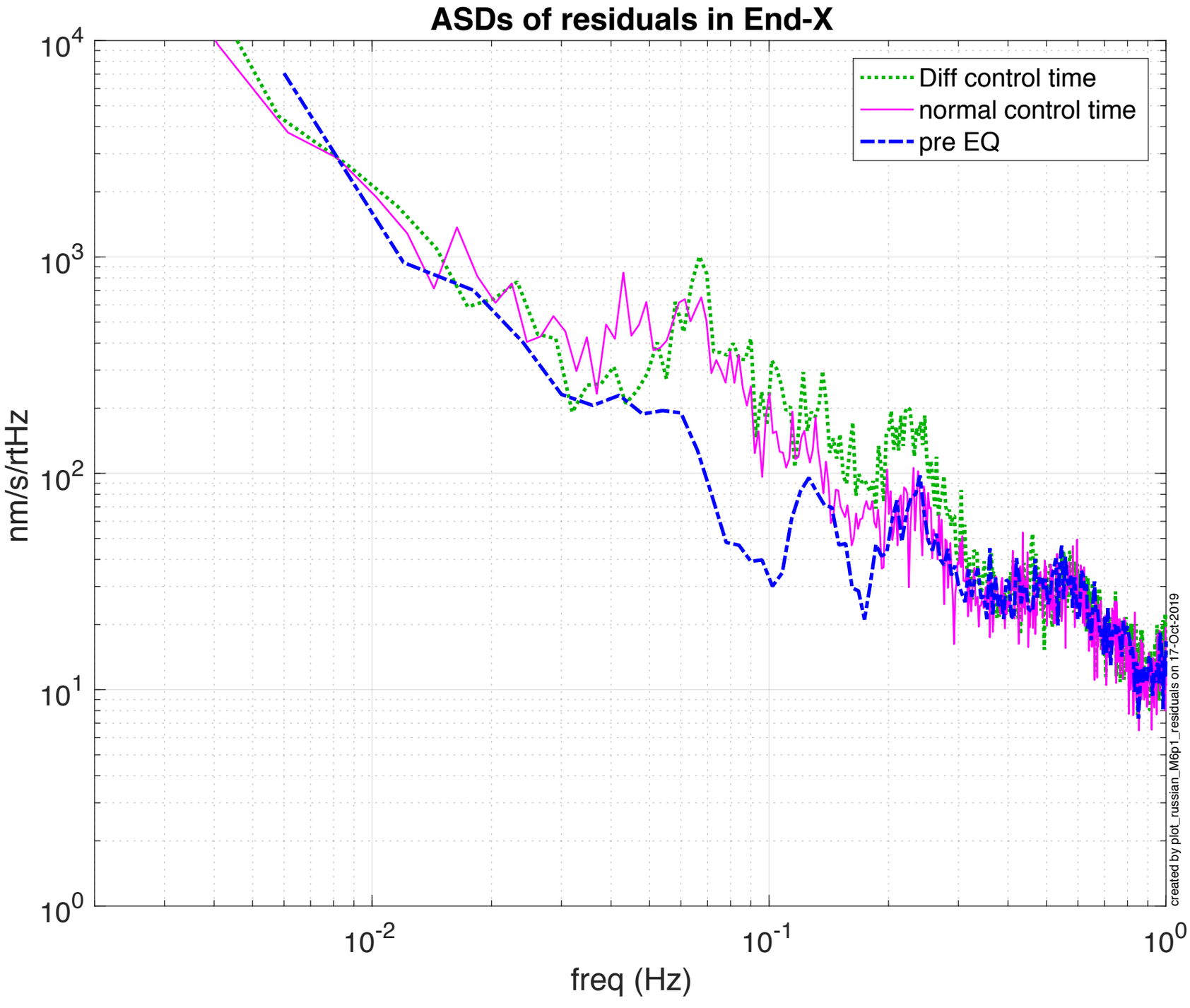
compare residuals (End-X)



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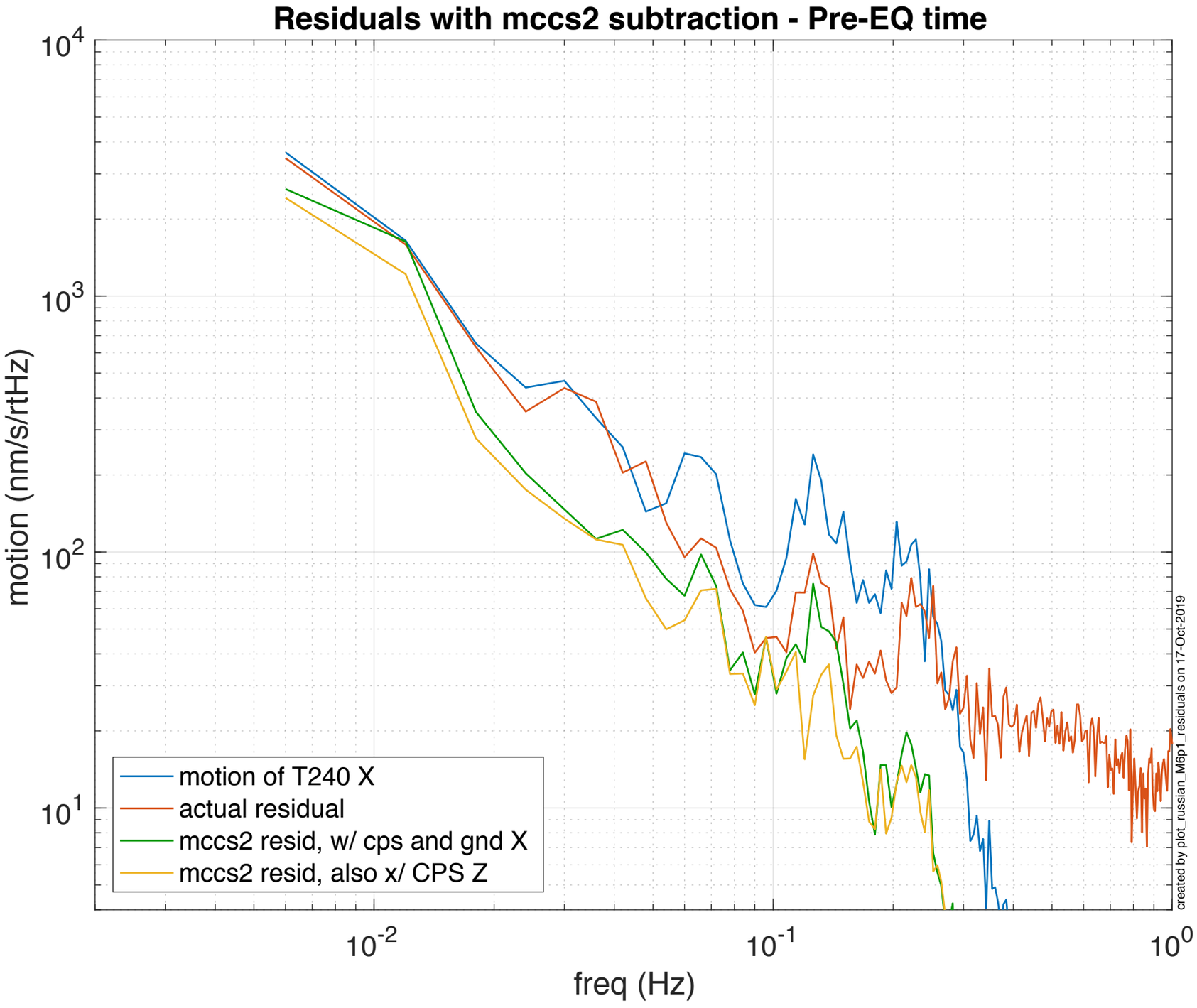
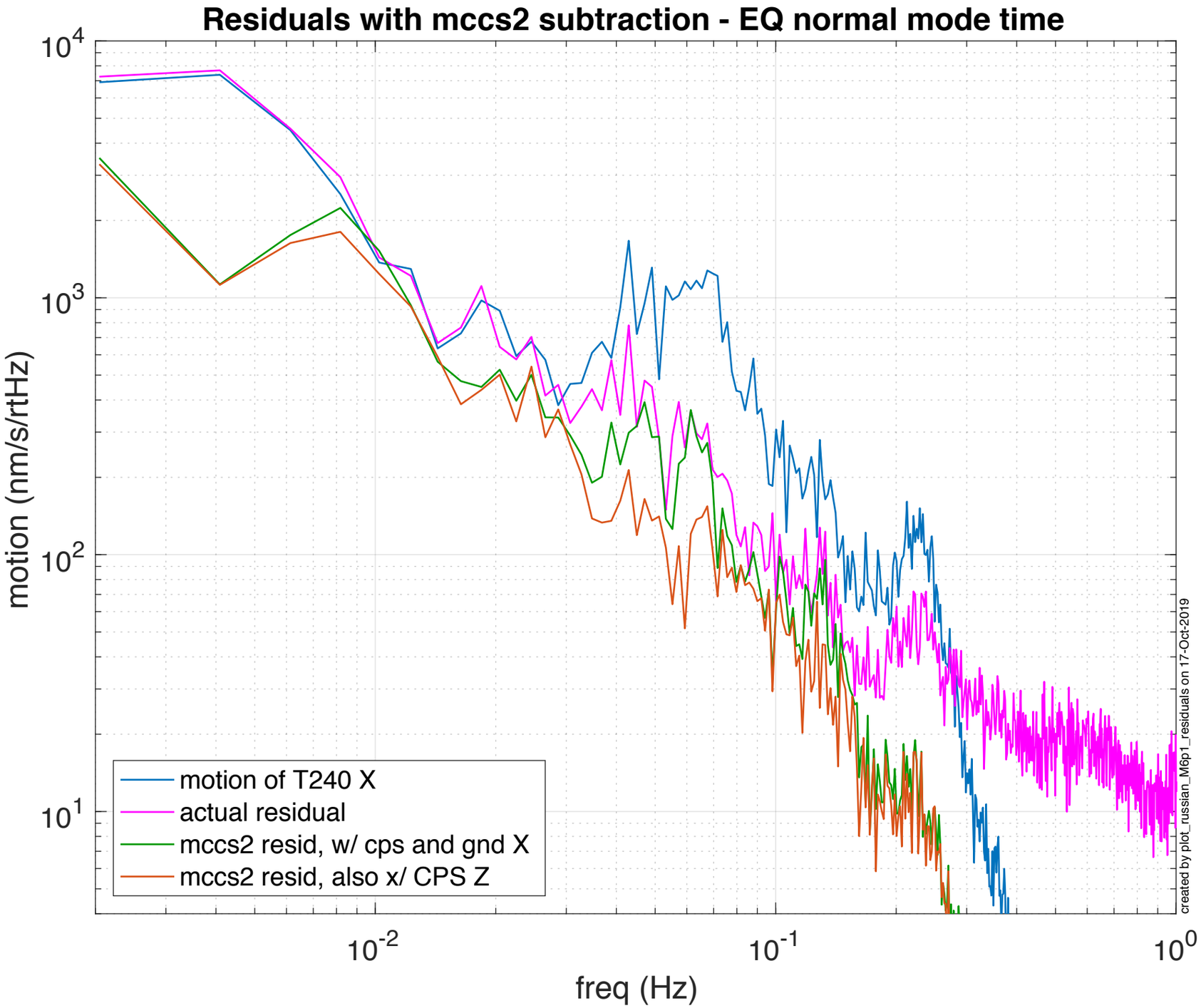
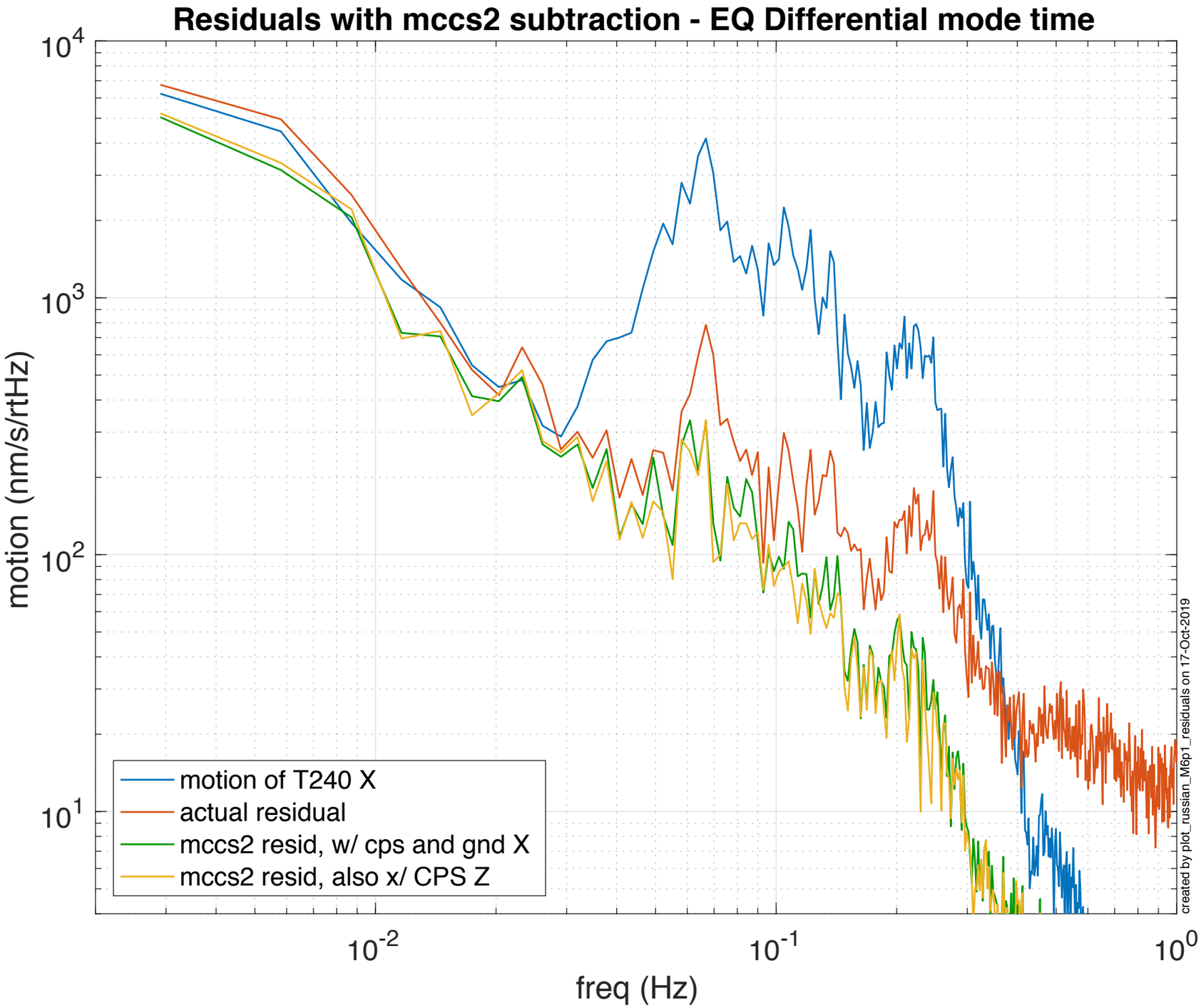
compare coh and mccs2 (ln-X)



compare coh and mccs2 (In-X)



compare coh and mccs2 (ln-X)