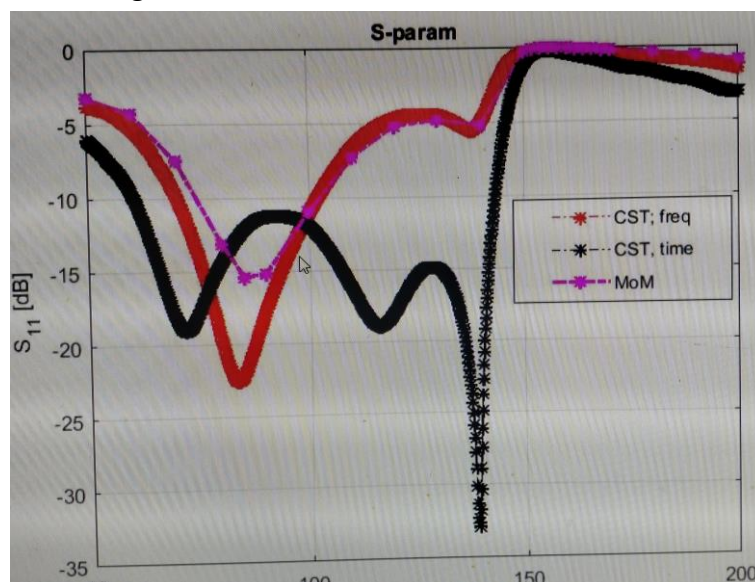


REACH antenna/receiver meeting minutes (06/04/2020)

Present: Nima, Dirk Quentin, John E, John C, Richard, Jean, Dominic, Ian, Harry, Ergin, Will, Steve

Antenna simulations:

Jean gave feedback from his simulations of the dipole antenna with balun. He noted that his wire model simulated in the custom MoM code matches well with CST's frequency domain solver but is completely different to the time domain solver output. It is noted that the response from the time domain solver is closer to what we would want for REACH.... e.g. the time domain S11 has a -10dB bandwidth of ~60-140, whilst the frequency domain response along with the MoM code gives a -10dB bandwidth of ~70-100MHz.



John C was surprised by this and has been trying to refine the mesh in CST. Dirk thinks this could be due to the simulation of the feed (i.e. the directive energies around the feed) which may not be handled well in these simulations.

Nima noted that a comparison of a simpler model without balun should be done (CST, FEKO and custom Memo). Dirk notes this was initially done by Brandt for the antenna without balun. It is agreed more analysis of this should be done in the coming weeks to understand why they are different. Dirk mentioned the balun measurements did not match well to the simulations but this was mostly due to the measurement environment.

Receiver and calibration:

Nima gave an overview of the system at home which is now useable and can be controlled completely remotely. The plan is to have Ian trained up in the next few days to use that system.

Nima is continuing along with Steve and John to work out most of the receiver system design, e.g. 2nd version of the uC board and TEC control etc. The idea being that orders could be placed as soon as the lab reopens.

Will mentioned that we were making progress on the calibration pipeline and hopefully have more to report in a couple of weeks.

Nima noted that taking this time to review some of EDGES technical memos is good and perhaps we can discuss 1 or 2 of these in each call. Link to these below:

MIT memo series

https://www.haystack.mit.edu/ast/arrays/Edges/EDGES_memos/EdgesMemo.html

ASU memo series

<http://loco.lab.asu.edu/memos/>