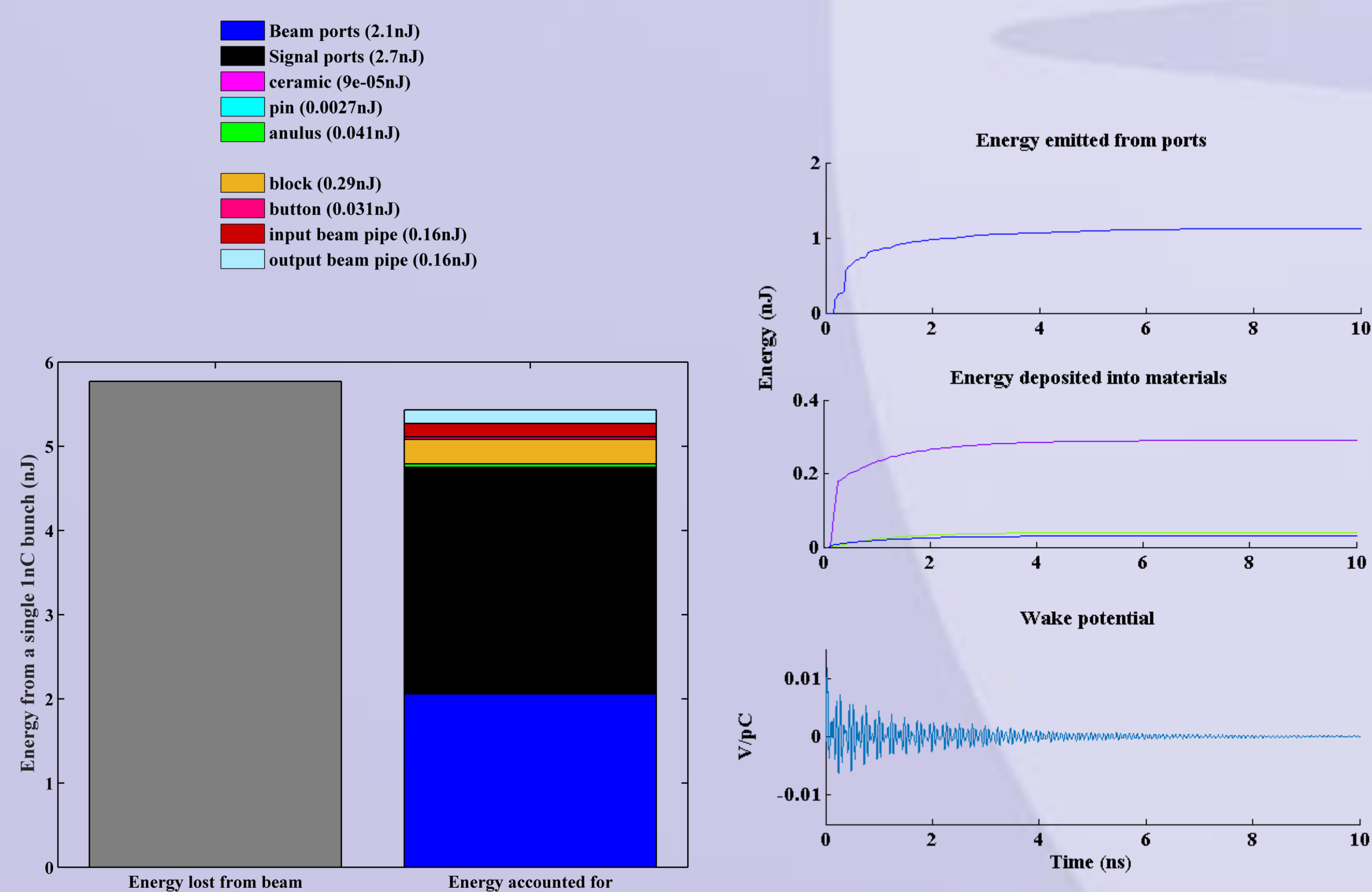


CONSIDERATIONS AND IMPROVED WORKFLOW FOR SIMULATION OF DISSIPATED POWER FROM WAKE LOSSES

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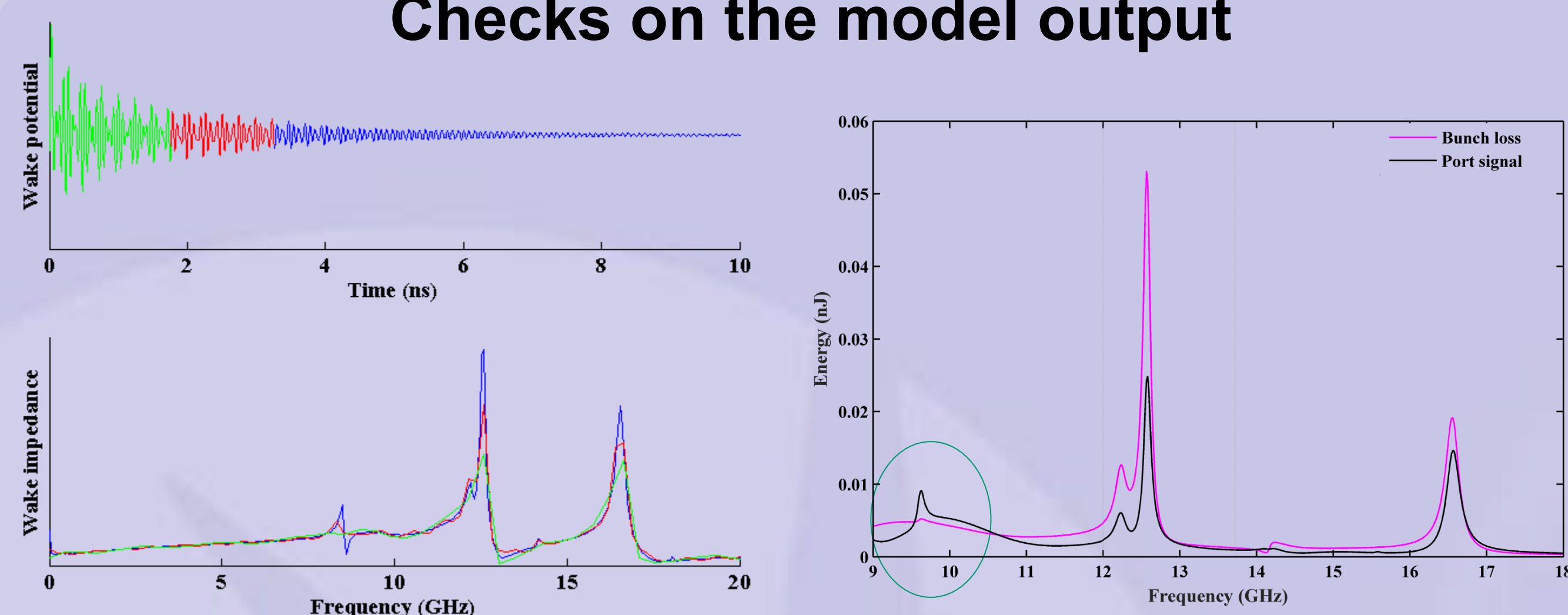
At Diamond quite some effort has gone into simulating and understanding the energy loss into structures induced by the passing beam. Due to changes in the core simulation code we use, it is now possible to extract the material loss information directly from the simulation rather than inferring it from other parts of the simulated output which was, by necessity, our previous method.

Energy accounting and model stabilisation



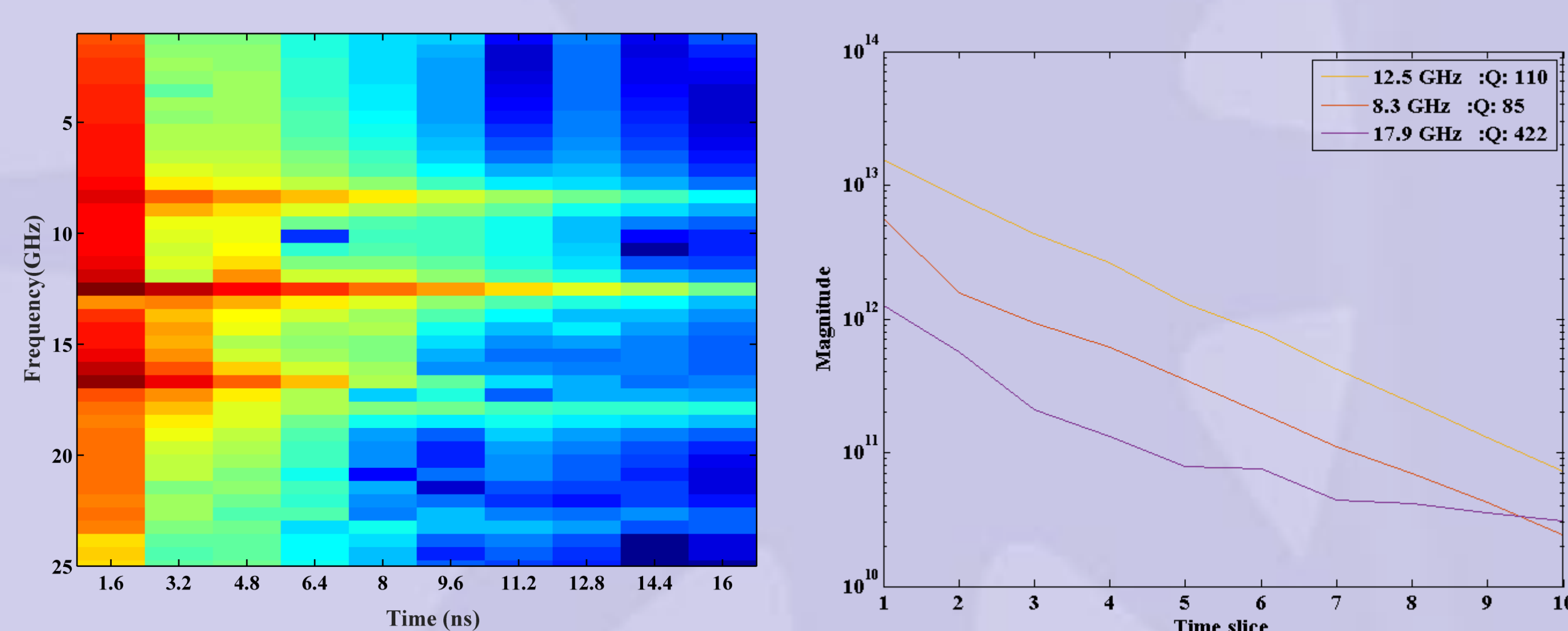
For a fully stabilised model, all the energy should be accounted for. From this we can determine the fraction of energy deposited in each material or subsection of the model. It also gives a good indication of how much energy will be sent down the signal ports, and thus if filters or circulators will be required. The contribution into the beam pipe ports shows how much re-emission into other structure there will be.

Checks on the model output



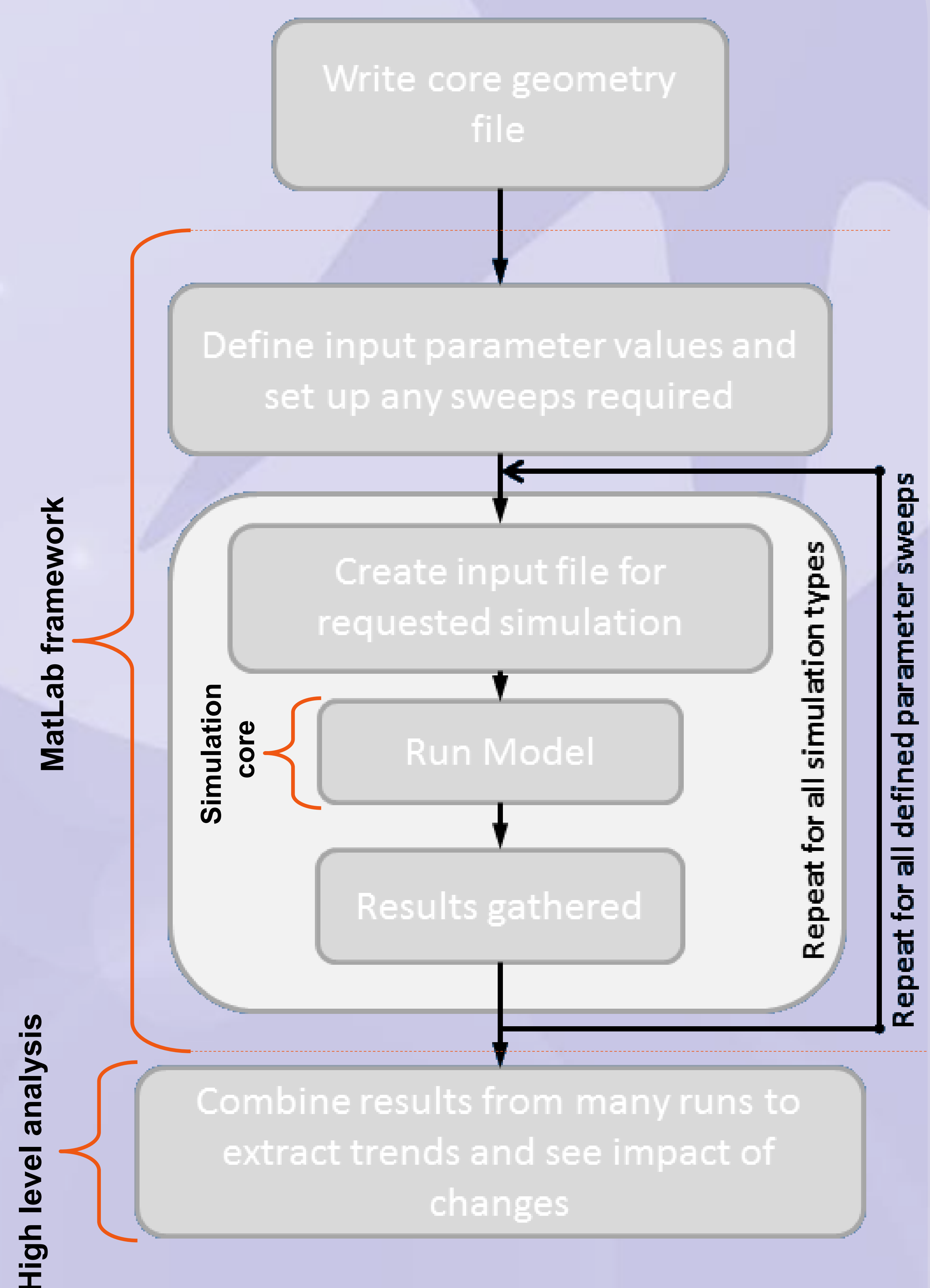
Truncation of the time data leads to errors in the wake impedance.

More energy coming out of the ports than was put in is unphysical.



Are the decays of the resonances following the expected exponential trend, and are the resulting Q values believable?

Basic workflow of simulation process



We have created a MatLab framework to surround a simulation core. Initially the simulation core was CST PS, more recently we have moved to GdfidL. High level MatLab code helps in the extracting of trends and the detailed study of specific aspects of a structures behaviour.

