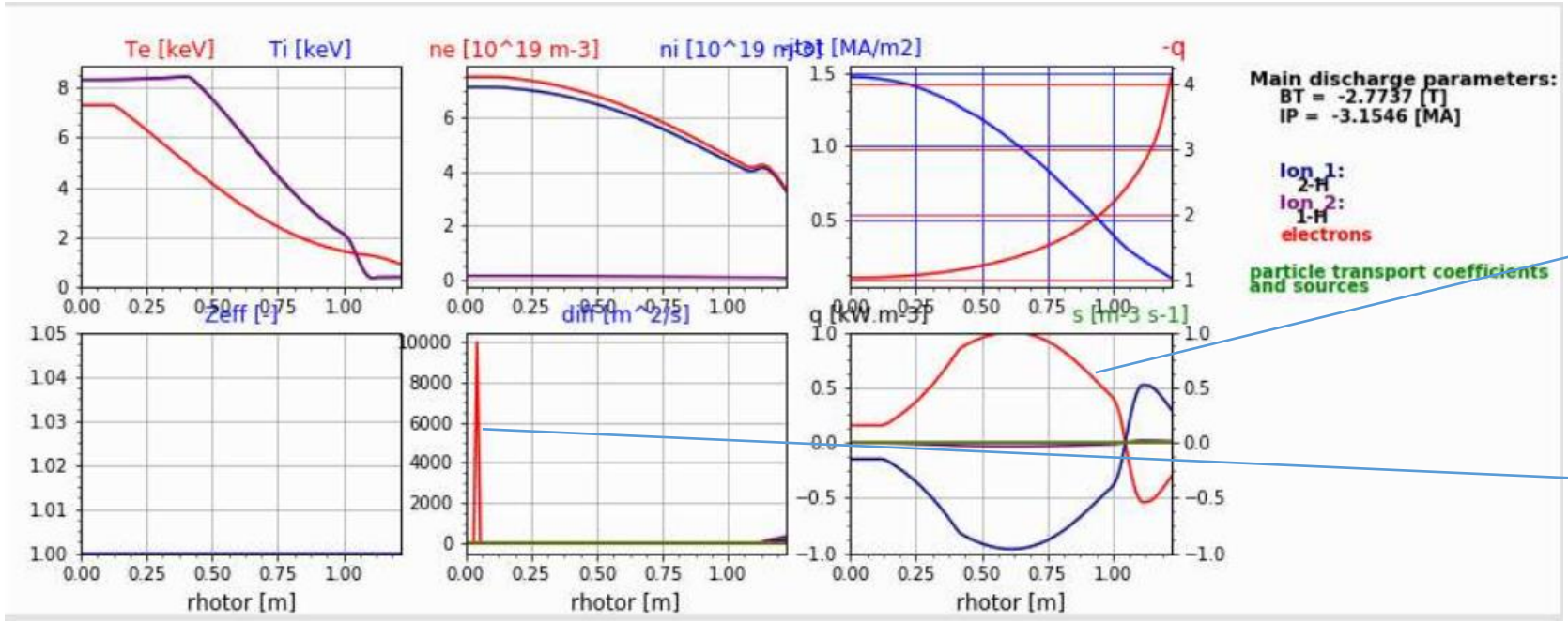
Follow up on the discussion (issue report) on 20-08-19

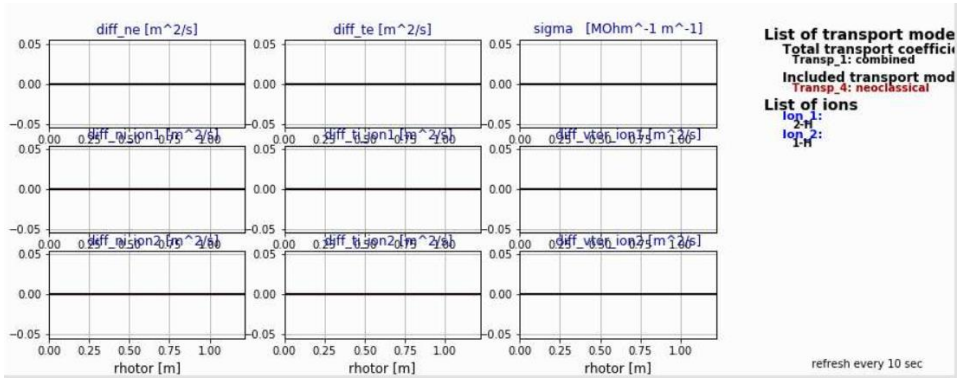
Starting point

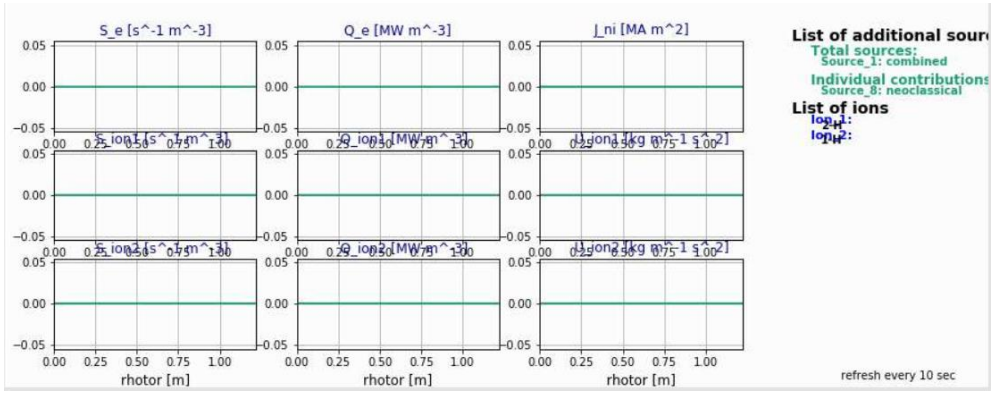
Default ETS shot/run, ETS 5.9.0



equilibration

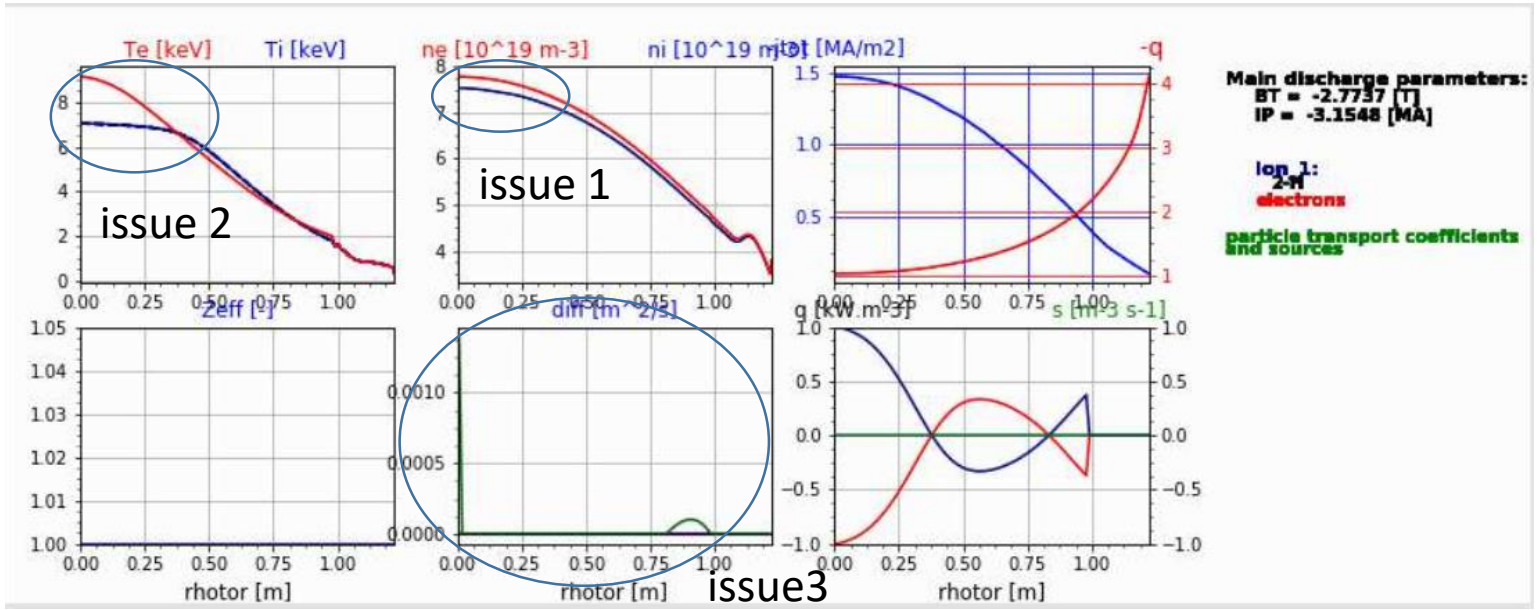
effective diffusivity





Test1: fully predictive run with D

Only D is used, ni is from quasineutrality, Te,Ti,ne are predictive, 0.9 sec simulation

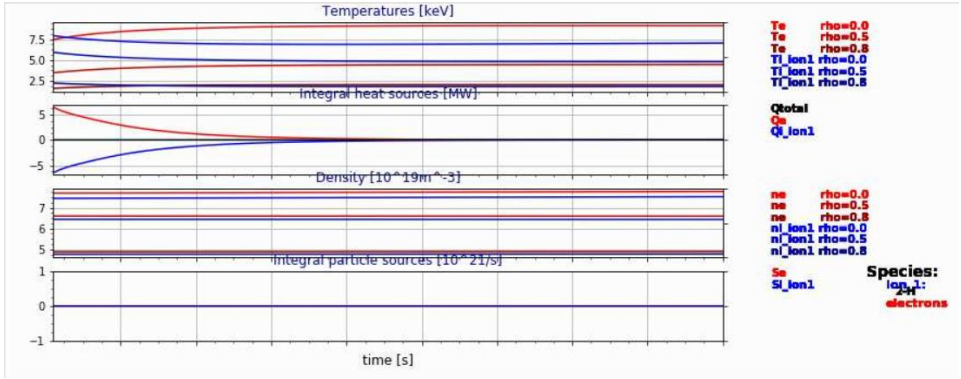


Issue 1: quasineutrality is not obtained

issue 2: no temperature equlibration

issue 3: spikes in transport coefficient

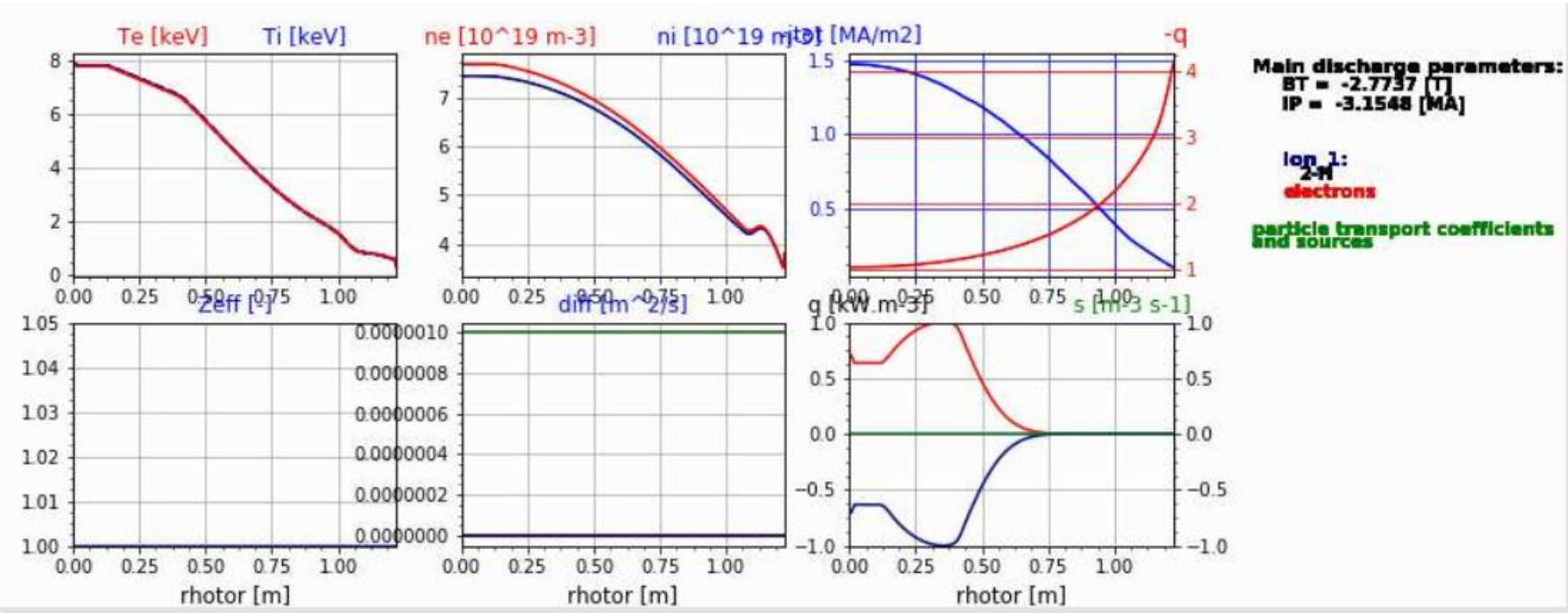
issue 1 explained: input shot/run includes fast particles that affect quasineutrality



issue 3 understood**: effective** transport coefficients calculation depend on the profiles of the 'base' quantity, geometry. Further investigation can be done

Test 1

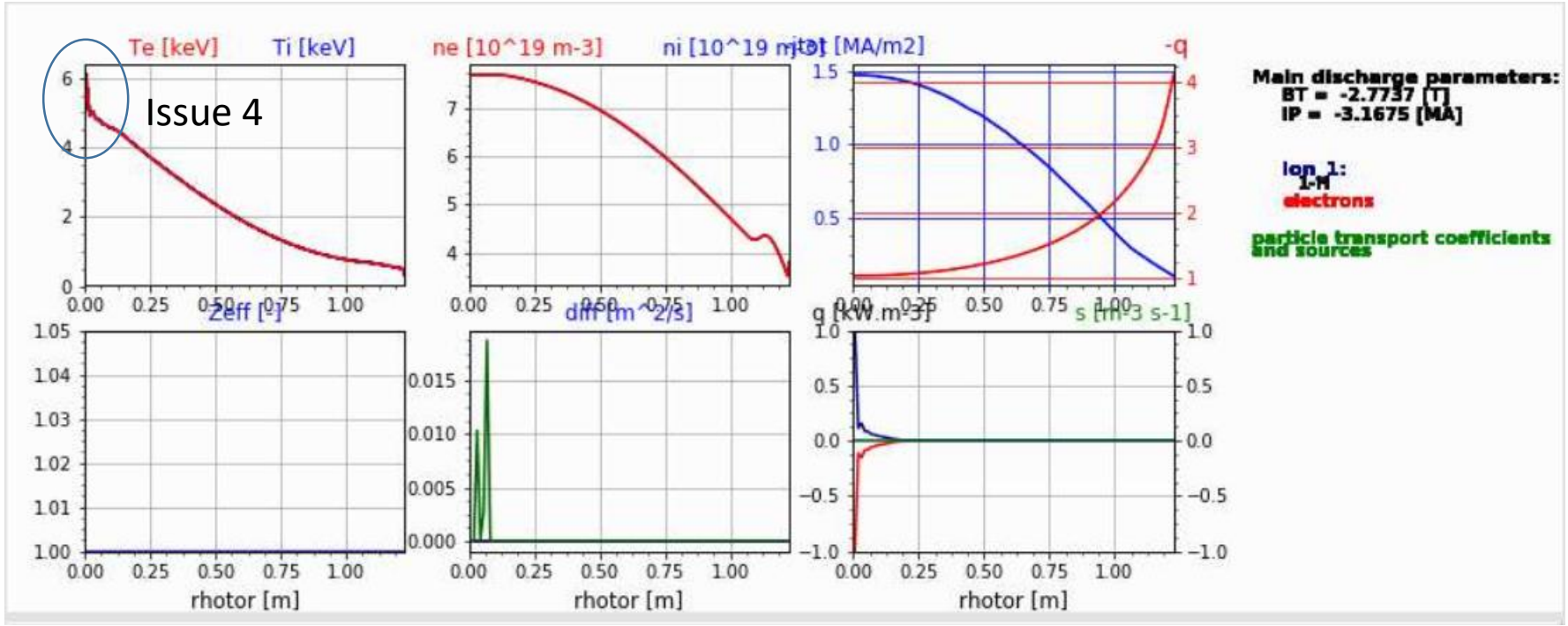
The same simulation without hyperdiffusivity



issue 2 understood: hyperdiffusivity affects the equilibration. Further investigation is probably needed

Test 2: predictive run with H

Without hyperdiffusion

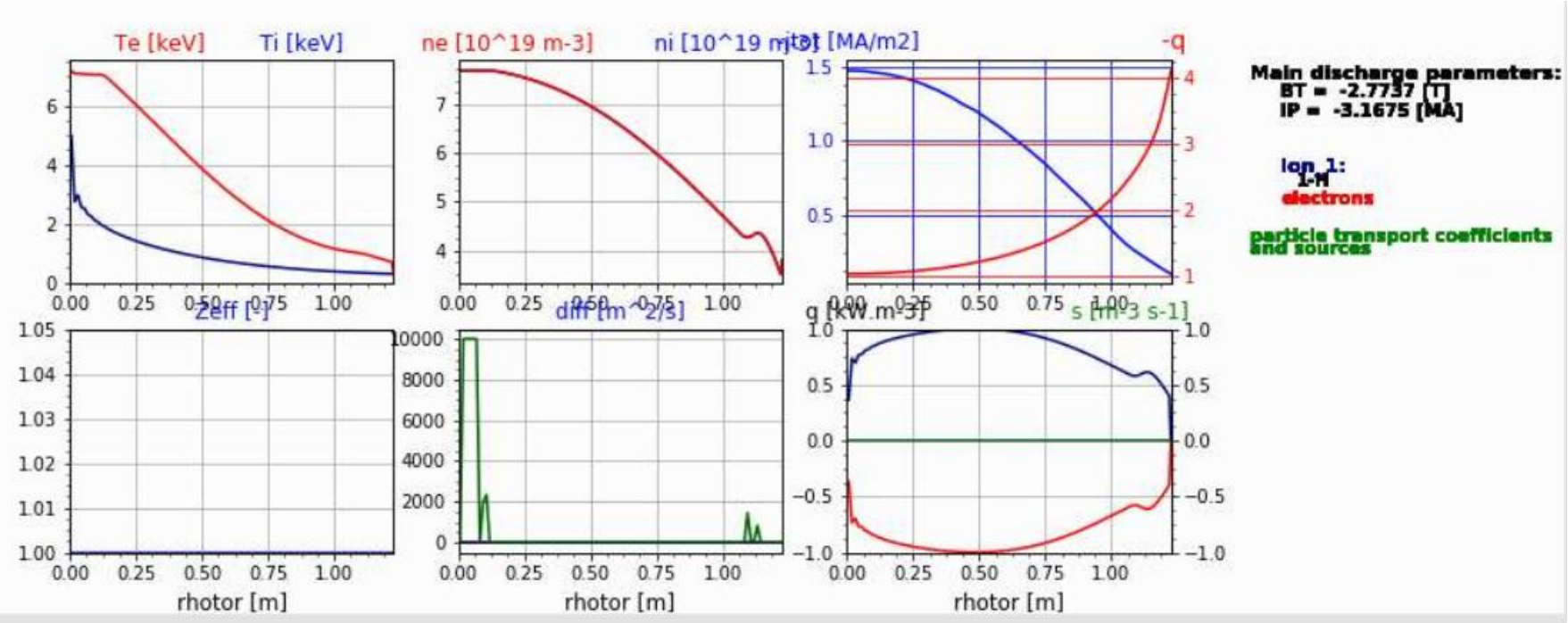


No issue 1: no fast particles for H in input shot/run

Issue 4: T profile in the center

Test 2

First time point



issue 4 explained: Te calculations depend on the ni(t) and ni(t-1). For the first time point ni(t-1) is taken from input shot/run (ETS5 feature) and is order of magnitude smaller that the n(i). Such jump creates artefacts in the Ti, that then are transferred to the Te via equilibration

Suggestion: do not start your predictive simulation from the ‘jumping’ evolution

Hyperdiffusivity can help in this case also, but the final result should be checked (see issue 2)