

Studies on impurity seeding in a tokamak plasma: simulation and comparison with Aditya-U

- Effects of N_2 , Ne, and Ar impurity seeding in Aditya-U tokamak plasma using 0D and 2D models are presented.
- 0D model gives relative abundance of multiply charged states of the impurity ions and estimates non-coronal radiation cooling. This radiation cooling is consistent with 2D simulation results.
- 2D model equations couples the interchange plasma turbulence in the edge and SOL regions with the impurity gas and ions self-consistently.
- Impurity ions fluxes in the presence of different magnitudes of the interchange driving mechanism are studied. A change of the inward (negative) flux of the impurity ions suggests the turbulence induced inward motion.
- The non-coronal radiation energy loss behaves intermittently with time that is in line with the interchange plasma turbulence and is consistent with experiments. We verified that the intermittent radiation frequency obtained from the Aditya-U is same order of magnitude with the simulation.