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SOLPS modelling of the edge plasma

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The SOLPS-ITER code uses atomic, molecular and surface data to model the edge plasmas of tokamaks and linear devices. This data is needed over a relatively wide range of plasma temperatures (0.1 eV or lower to approximately 5 keV for the pedestal of ITER) and plasma densities (10^{17} m^{-3} to 10^{22} m^{-3}) for the atomic data, and a somewhat smaller temperature range for the molecular data. For the surface data, sputtering and reflection data is needed for all considered plasma species hitting all considered surface species, in the possible presence of mixed materials, including the possible preferential sputtering of light atoms deposited on heavier atoms. For molecular data, a full data set of reactions involving molecules and molecular ions, including mixtures of isotopes, is desired. In this context, a reflection model capable of dealing with mixed isotopes is desired.

An important consideration for all data is that they should be **robust** over the range that they are used – by this is meant that the data should not blow-up even if used beyond their formal domain of applicability, and provide physically sensible results (reflections coefficients should not exceed 1, cross-sections should be positive).

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