Gas flow and related beam losses in the ITER beam sources

[1]A. Krylov, [2]R. Hemsworth
Alexander.Krylov@cea.fr.

[1]Kurchatov Institute, pl. Kurchatova 1, Moscow 123182, Russia
[2]Association EURATOM-CEA, CEA Cadarache, F-13108, St. Paul lez Durance, France

The gas flow in the ITER neutral beam injectors [1,2] has been studied using a 3D Monte-Carlo code to define a number of key parameters affecting the design and operation of the injector. This paper presents the results of calculations of the gas density in the two accelerator concepts presently considered as options for the ITER injectors (MAMuG and SINGAP), and the resultant stripping losses of the negative ions during their acceleration to 1 MeV. The sensitivity of the model to various parameters has been studied, including the gas temperature in the ion source and the subsequent accommodation by collisions with the accelerator structure, and the degree of dissociation of the D_2 or H_2 in the ion source, and subsequent recombination during collisions with the accelerator structure. Additionally the sensitivity of the losses to details of the beam source design and operating parameters are examined for the both accelerator concepts

[1] T. Inoue, *et al*, "Design of neutral beam system for ITER-FEAT", Fusion Engineering and Design, 56-57 (2001) 517-521.

[2] R.S. Hemsworth, "Long pulse neutral beam injection", Nuclear Fusion, 43 (2003) 1-11.