

# Databases, data evaluation and coordinated research projects at the IAEA atomic and molecular data unit

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This poster contribution at the VAMDC meeting in November 2012 is drawn from our contributions to the ICAMDATAmeeeting that took place in September 2012. The IAEA Atomic and Molecular Data Unit has the mission to support the development of fusion energy by providing internationally evaluated and recommended data for atomic, molecular and plasma-material interaction (A+M+PMI) processes. The Unit organizes technical meetings and coordinates an international A+M Data Centre Network (DCN) and an international Code Centre Network (CCN). In addition the Unit organizes Coordinated Research Projects (CRPs), for which the objectives are mixed between development of new data and evaluation and recommendation of existing data.

We want to encourage new work on data evaluation and more particularly on assigning uncertainties to calculated cross section data. A technical meeting on data evaluation was held in Daejeon, Korea, from 4 to 7 September 2012. Approximately 30 people from 11 countries participated to discuss relevant issues: 1) Error Propagation and Sensitivity Analysis, 2) Current Status of Evaluated Data bases, 3) Uncertainty Estimates of Theoretical Data, 4) Experimental Data Evaluation, 5) Data Evaluation Methods and Semi-Empirical Fits and 6) Establishment of Evaluators' Network. The meeting resulted in plans for 3 carefully documented evaluation projects: one on collisional data for beryllium, one on electron collisions with CH<sub>4</sub> and one on charge transfer and ionization in the collision of H with Be<sup>q+</sup>. There will also be a concerted effort to develop written guidelines or recommendations for uncertainty assignment for calculated data.

The Unit manages 3 active CRPs on atomic and molecular processes. The CRP on "Light Element Atom, Molecule and Radical Behaviour in the Divertor and Edge Plasma Regions" (2009-2013) is focused on collisional data for first row elements and their hydrides in fusion edge plasma. The CRP on "Spectroscopic and Collisional Data for Tungsten from 1 eV to 20 keV" (2010-2014) aims to provide comprehensive recommended data for tungsten impurity in core and edge plasma. The CRP on "Atomic and Molecular Data for State-Resolved Modelling of Hydrogen and Helium and Their Isotopes in Fusion Plasma" has the objective to develop a comprehensive database for the main species in divertor and edge plasma.

The Unit's new and planned CRPs are all in the area of plasma-material interaction. A CRP on "Data for Erosion and Tritium Retention in Beryllium Plasma-Facing Materials" started in 2012. We anticipate a CRP on "Plasma-wall Interaction for Irradiated Tungsten and Tungsten Alloys" to start early in 2014. Tentatively the next CRP to start after that is one on "Plasma-wall Interaction with Low-activation Steel Surfaces", but this would be only in 2015 and plans are subject to change.