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[Plenary Lecture]

Molecular data for climate science

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Abstract: For investigation and understanding of atmospheric processes influencing on climate and for research of chemical reactions and processes in atmosphere, reliable molecular data may be of great interest. However, the main problems which are an obstacle for an efficacious search and use of the needed molecular data are among others: a) Lack of standards; b) Interoperability; c) Data exchange; d) Critical evaluation. In order to solve these problems on July 1 2009 Virtual Atomic and Molecular Data Center (VAMDC – Albert et al., 2020, Dubernet et al., 2010, 2016) started, first as a FP7 project: Now it is a Consortium of Databases and Services Providers that has built a unified, secure, documented, flexible and interoperable e-science environment-based interface e-Infrastructure for the exchange of atomic and molecular data. It connects 39 databases which can be searched simultaneously and its partners are from Australia, Austria, France, Germany, India, Italy, Japan, Korea, Russia, Serbia, South Africa, Sweden, UK, USA and Venezuela. The databases contain many different molecular data of interest as for example kinetic data interesting for astrochemical (planetary atmospheres and interstellar medium) studies, photo dissociation cross-sections of molecular ions from individual rho-vibrational states and cross-sections and rate coefficients for radiative ion-atom collisional processes, collisional rho-vibrational excitation of molecules by colliders such as atom, ion, molecule or electron, catalog of radio frequency and microwave to far-infrared spectral

lines of atomic and molecular species that (may) occur, for example, in planetary atmospheres, bibliographic database of literature on fundamental atomic and molecular processes etc. In this contribution we will present Virtual Atomic and Molecular Data Center and the corresponding molecular databases of interest for atmospheric research.

Keywords: Molecular data, Databases, e-infrastructure, Data exchange

References

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