

Characterization Of Subsonic Gas Flows To Be Used For MARA-Low Energy Branch Project

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Abstract

Ion Guide Isotope Separation On-Line (IGISOL) [1] is an experimental technique used to thermalize and transport exotic nuclei in subsonic gas flows. Experimental studies of properties of exotic nuclei are challenging as nuclei of interest often have short lifetimes and small production yields. To facilitate the studies, thorough understanding and characterization of utilized gas flows are essential.

Recently, tests were performed with a new gas cell which shape was optimized using numerical calculations in COMSOL Multiphysics® CFD Module. Parameters of the gas cell, such as evacuation time profiles and ion survival efficiency, were characterized via numerical calculations in COMSOL Multiphysics® and also experimentally, by using radioactive ²²³Ra source installed inside the gas cell. Numerical calculations of the gas flow inside the gas cell were performed using the "Laminar Flow" and "Transport of Diluted Species" sections within the CFD Module. Results of aforementioned tests will be reported in this poster.

[1] I. D. Moore, P. Dendooven, and J. Ärje, The IGISOL technique—three decades of developments. In: Äystö J., Eronen T., Jokinen A., Kankainen A., Moore I.D., Penttilä H., Three decades of research using IGISOL technique at the University of Jyväskylä. Springer, Dordrecht (2013)