

# Systematic TDDFT data for nuclear fission analysis

*Monday, June 11, 2018 5:30 PM (30 minutes)*

Nuclear fission is an important process that is not well understood microscopically. The nuclear Time-Dependent Density Functional Theory (TDDFT), which is a microscopic theory accounting for the nucleon degrees of freedom, describes dynamics of atomic nuclei [1]. Recent computational developments enable us to obtain physical quantities systematically from the TDDFT calculations. Those results are now utilized to astrophysics, nuclear engineering, and so on. In this paper, with respect to the utility for the fission analysis (for our previous results of fission and the related fundamental mechanism, see [2-6]), we focus on the systematics of fission barrier heights and the friction coefficients (cf. Figure). As a result the possibility of making (TD)DFT-based nuclear database is discussed.

[1] Y. Iwata, T. Otsuka, J. A. Maruhn, and N. Itagaki, Phys. Rev. Lett. 104 (2010) 252501.

[2] Y. Iwata and S. Heinz, EXON-2012, World Scientific (2012) 153-162.

[3] Y. Iwata and S. Heinz, CERN Proceedings 2012 – 002 (2013) 241

[4] Y. Iwata and S. Heinz, J. Phys. Conf. Ser. 420 (2013) 012012.

[5] Y. Iwata, Mod. Phys. Lett. A 30 (2015) 155008.

[6] J. R. Stone, P. Danielewicz, Y. Iwata, Phys. Rev. C 96 (2017) 014612.

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**Session Classification:** Fission

**Track Classification:** Fission