

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Isospin transfer modes in exotic nuclei¹ ELENA LITVINOVA, Western Michigan University, TOMISLAV MARKETIN, University of Zagreb, PETER RING, Technical University of Munich — This work presents a self-consistent approach to nuclear spin-isospin response, which attempts to describe simultaneously the overall strength distribution up to high excitation energy, quenching and the fine structure of the low-lying strength. The approach is based on the extension of the covariant energy density functional (CEDF) theory. The effective one-boson exchange interaction spans effective mesons and emergent collective modes. While heavy mesons are treated as classical fields, the low-lying collective phonons are included within non-perturbative quantum field theory schemes in the time-blocking approximation. Thus, the covariant spin-isospin response theory has been advanced to the inclusion of temporal and spatial non-localities [1,2] while pairing correlations of the superfluid type are included on the equal footing by means of the Gorkov's Green functions. The approach based on a few parameters of the CEDF provides a high-quality description of nuclear excitation spectra in both neutral and charge-exchange channels. Results of the recent calculations for spin-isospin response of exotic medium-mass nuclei studied at NSCL and RIKEN are presented and discussed.

- [1] T. Marketin, E. Litvinova, D. Vretenar, P. Ring, Phys. Lett. B 706, 477 (2012).
[2] E. Litvinova, B.A. Brown, D.-L. Fang, T. Marketin, R.G.T. Zegers, Phys. Lett. B 730, 307 (2014).

¹Supported by NSCL and NSF grant PHY-1204486.

Elena Litvinova
Western Michigan University

Date submitted: 01 Jul 2014

Electronic form version 1.4