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Nuclear spin-isospin excitations from covariant quasiparticle-vibration coupling[1] CAROLINE ROBIN, ELENA LITVINOVA, Western Michigan University — Methods based on the relativistic Lagrangian of quantum hadrodynamics and nuclear field theory provide a consistent framework for the description of nuclear excitations, naturally connecting the high- and medium-energy scales of mesons to the low-energy domain of nucleonic collective motion. Applied in the neutral channel, this approach has been quite successful in describing the overall transition strength up to high excitation energies, as well as fine details of the low-lying distribution [1]. Recently, this method has been extended to the description of spin-isospin excitations in open-shell nuclei [2]. In the charge-exchange channel, the coupling between nucleons and collective vibrations generates a time-dependent proton-neutron effective interaction, in addition to the static pion and rho-meson exchange, and introduces complex configurations that induce fragmentation and spreading of the resonances. Such effects have a great impact on the quenching of the strength and on the computing of weak reaction rates that are needed for astrophysics modeling. Gamow-Teller transitions in medium-mass nuclei and associated beta-decay half-lives will be presented. Further developments aiming to include additional ground-state correlations will also be discussed. [1] E. Litvinova et al. PRC 78, 014312; E. Litvinova et al. PRC 79, 054312. [2] C. Robin, E. Litvinova, arXiv:1605.00683, submitted to EPJA.

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