

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

$\beta\beta$ -decay nuclear matrix elements and half-life predictions in the interacting boson model with isospin restoration¹ J. KOTILA², Yale University, J. BAREA, Universidad de Concepcion, F. IACHELLO, Yale University — Recently, we have introduced a method for isospin restoration in the calculation of nuclear matrix elements (NME) for $0\nu\beta\beta$ and $2\nu\beta\beta$ decay within the framework of IBM-2 [1]. With this method, we calculate NME for all processes of interest in $0\nu\beta^-\beta^-$, $2\nu\beta^-\beta^-$, and in $0\nu\beta^+\beta^+$, $0\nu\beta^+EC^+$, $0\nu ECEC$, $2\nu\beta^+\beta^+$, $2\nu\beta^+EC$, and $2\nu ECEC$. With isospin restoration, we find that the Fermi (F) matrix elements for $2\nu\beta\beta$ vanish, as expected, and those for $0\nu\beta\beta$ are considerably reduced. By combining these matrix elements with recently calculated phase-space factors [2-4] we are able to make our most accurate half-life predictions for all discussed processes.

- [1] J. Barea, J. Kotila and F. Iachello, In preparation.
- [2] J. Kotila and F. Iachello, Phys. Rev. C **85**, 034316 (2012).
- [3] J. Kotila and F. Iachello, Phys. Rev. C **87**, 024313 (2013).
- [4] J. Kotila, J. Barea, and F. Iachello, Phys. Rev. C **89**, 064319 (2014).

¹This work was supported in part by US Department of Energy Grant no. DE-FG-02-91ER-40608, Fondecyt Grant No. 1120462, and Academy of Finland Grant No. 266437.

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Date submitted: 02 Jul 2014

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