

## FUSTIPEN Trip Report: GANIL 09/30/2013 to 10/11/2013

This was a follow-up of a FUSTIPEN grant for an exploratory visit on March 2011 to work with Dr. Piet Van Isacker.

As a result of that initial visit, we studied the geometry of the shears bands within a formal shell model approach. By making use of classical limits of the re-coupling coefficients entering the energy expressions, the rotational-like motion observed in these bands seems to appear naturally. Our results were published as a Rapid Communication, Phys. Rev. C **87**, 061301. We also worked on some aspects of neutron-proton pairing.

This request for support was submitted and approved on October of 2012, with the purpose of continuing the work on  $np$  pairing. I traveled to Caen on September 30<sup>th</sup>, 2013 and returned to the US on October 12<sup>th</sup>.

A boson mapping of  $J=0$  and  $J=1$  pairs was developed to study the spin of the ground state of an  $N=Z$  nucleus. It is shown that, with dominant  $T=0$  character, this appears to be an aligned “quasi-deuteron” configuration, ie.  $I^P=N_d * 1^+$ . We discussed the potential for extending the boson mapping using the LS coupling scheme to study this transition, that seems to be driven by the spin-orbit splitting. A manuscript is in preparation.

During the stay, we discussed other topics related to our experimental program at LBNL: shape-coexistence in  $N=28$ , and the application of a seniority inspired model in neutron rich C isotopes. On a more general topic, we had interesting discussions with Dr. Marek Ploszajczak on changes in the structure of exotic nuclei due to coupling to the continuum.

Taking advantage of the visit, we organized a FUSTIPEN Topical Meeting on «Dipole collectivity in nuclei» that took place October 3-4, 2013 at GANIL. The workshop was very informative and productive, allowing for interesting discussions among the theorists and experimentalists. I presented an overview talk on the experimental aspects of the M1 bands and Dr. Van Isacker the results of our work.

Besides the main topic of collaboration, the trip gave me also the opportunity of meeting experimental colleagues at the facility. In particular, we had discussions with Drs. De France and Clement on the plans for the AGATA campaign at GANIL.

I believe this was another stimulating and productive visit to GANIL. Once again, I would like to thank the FUSTIPEN Governing Board for this grant, and express my gratitude to the local staff at GANIL, their help and hospitality made my stay a most enjoyable experience.

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