



Contribution ID: 90

Type: Oral Presentation

## Nuclear structure studies in the A=136 mass region using transfer reactions.

*Tuesday, 30 June 2015 10:20 (20 minutes)*

**Abstract content**   
 (Max 300 words)   
 [http://events.saip.org.za/getFile.py/a?target=\\_blank](http://events.saip.org.za/getFile.py/a?target=_blank)   
 **Formatting & Special chars**

Presently there is a great deal of interest to experimentally observe neutrinoless double beta ( $0\nu\beta\beta$ ) decays. This exotic decay mode can only be observed in a few isotopes over the nuclear chart. An observation of  $0\nu\beta\beta$  decay would signify physics beyond the standard model and the decay rate can be used to determine the absolute scale of neutrino masses. A major difficulty in extracting the effective neutrino mass from the decay lifetime arises from the uncertainties associated with the matrix element calculated for the decay. One of the most promising candidate for observing this decay mode is the decay of  $^{136}\text{Xe}$  to  $^{136}\text{Ba}$ . There are several experiments planned world-wide to observe the  $0\nu\beta\beta$  in  $^{136}\text{Xe}$ . In this talk I present preliminary results from the  $^{138}\text{Ba}(d,a)$  reaction used to study low lying excited states in  $^{136}\text{Cs}$ , which is the intermediate nucleus in  $^{136}\text{Xe}$   $0\nu\beta\beta$  decay. I will also discuss future plans to study neutron pairing in the daughter  $^{136}\text{Ba}$  nucleus via the  $^{138}\text{Ba}(p,t)$  reaction using the same approach. Our results will provide useful spectroscopic information for the matrix element calculations in this mass region.

**Apply to be considered for a student award (Yes / No)?**

Yes

**Level for award (Hons, MSc, PhD, N/A)?**

PhD

**Main supervisor (name and email) and his / her institution**

Prof. Smarajit Triambak, smarajit@gmail.com, University of the Western Cape

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

no

**Please indicate whether this abstract may be published online (Yes / No)**

yes

**Primary author:** Ms REBEIRO, Bernadette (University of the Western Cape)

**Co-authors:** VARELA, Alejandra (University of Guelph); RADICH, Allison (University of Guelph); BURBADGE, Christina (University of Guelph); RAND, Evan (University of Guelph); BALL, Gordon (TRIUMF); WIRTH, Hans (Technische Universität München); GARRETT, P. E. (University of Guelph); HERTENBERGER, Ralf (Technische Universität München); TRIAMBAK, Smarajit (University of the Western Cape); FAESTERMANN, Thomas (Technische Universität München); BILDSTEIN, Vinzenz (University of Guelph)

**Presenter:** Ms REBEIRO, Bernadette (University of the Western Cape)

**Session Classification:** NPRP

**Track Classification:** Track B - Nuclear, Particle and Radiation Physics