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### Personal information

Last name:	First name:	Dept.:
Perez Loureiro	DAVID	NSCL

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Supervisor: Christopher Wrede

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### Conference details

Communication type :	Date:	Location:	Total Expense
<b>Oral presentation</b>	July 24-29 2016	Knoxville, TN	(USD): \$1660.0

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### Communication title

Beta delayed gamma decay of Phosphorus-26: evidence for a proton halo?

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## ABSTRACT

Since its discovery in 1909, understanding the structure of the atomic nucleus has been of utmost interest. However, until a few decades ago, our knowledge of the nuclear force, and hence the nuclear structure was limited to the study of the stable nuclei, and those close the stability.

During the last decades, radioactive ion beam facilities made it possible to reach the limits of the nuclear landscape, revealing new properties of atomic nuclei. For instance, extremely proton- or neutron-rich light nuclei have exhibited what is called nuclear halos. This phenomenon can be pictured as the existence of one or two nucleons orbiting around a compact core. The manifestation of this property is an enhancement of the reaction probability compared to other isotopes of the same nucleus. However, sometimes these reaction probabilities cannot be investigated because of the limited intensities of the ion beams.

In a recent experiment carried out at the National Superconducting Cyclotron Laboratory the measurement of the beta decay properties of the very proton-rich nucleus Phosphorus-26 revealed a significant asymmetry compared to its mirror nucleus Sodium-26. This asymmetry can be interpreted as the evidence of a proton halo in Phosphorus-26, showing that beta decay might be used as probe for nuclear halos. The advantage of this new technique is that it is not limited by the intensity of the ion beam. In this contribution, the results of this experiment will be presented, as well as the application of this technique to other nuclei.

## COMMUNICATION OUTCOMES

Since my joining Prof. Wrede's group at NSCL as a Research Associate, I have been working in parallel in two different projects: developing a new detector for future nuclear astrophysics experiments and the analysis of the data of a previous experiment. The work to be presented at the Nuclear Structure Conference in Knoxville TN this summer is the result of more than two years' data analysis work. The comprehensive data obtained are the most complete data set on the beta delayed gamma decay of Phosphorus-26 up to date. In addition to that, the significant asymmetry observed compared to its mirror nucleus might be evidence for the existence of a proton halo, which might be an alternative method for future searches for halos in nuclei very far from stability.

Presenting my work at this conference will be an excellent opportunity to communicate the results of my research within a community of experts in the nuclear structure field. The opportunity to meet and discuss my results with these scientists will be very helpful, not only to create the possibility of future collaborations but also to make professional contacts that will enhance my future career.

## PREDICTED TRAVEL EXPENSES

<b>Item</b>		<b>amount (in USD)</b>
Conference Registration	\$	450.00
Airfare	\$	450.00
Per diem meals 5 days	\$	300.00
Hotel 5 days	\$	460.00
<a href="#">Click here to enter text.</a>	\$	-
<a href="#">Click here to enter text.</a>	\$	-
<a href="#">Click here to enter text.</a>	\$	-
<b>Total</b>	<b>\$</b>	<b>1,660.00</b>