
## Poster session 2 – Tuesday 5 July

P2.069 **The $^{9}$Li/$^{8}$He predicted spectra and their yield measurements with the Double Chooz experiment**

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*on behalf of Double Chooz collaboration*

Double Chooz is a reactor neutrino experiment whose principle purpose is the measurement of the neutrino mixing angle $\theta_{13}$. Created by cosmogenic muons, $^{9}$Li & $^{8}$He are a source of background for Double Chooz and other anti-neutrino detectors where their production is allowed. Their $\beta$-n decay branches perfectly mimic the Inverse Beta Decay (IBD) signal.

A likelihood approach was developed to effectively select and remove $^{9}$Li/$^{8}$He candidates from the IBD sample. The same events were then used to make a measurement of the $^{8}$He fraction using the predicted spectra. The predicted spectra were created using current $^{9}$Li/$^{8}$He decay data where any uncertainty was included in covariance matrices.

The $^{8}$He fraction was used to measure the $^{9}$Li & $^{8}$He cosmogenic yields at the Double Chooz far detector site corresponding to an overburden of 300 mwe. Comparisons made to complementary measurements by KamLAND (2700 mwe) and Borexino (3800 mwe) give the relationship between depth, or mean muon energy and yield across the three experimental sites and allows future liquid scintillator experiments the ability to estimate their $^{9}$Li rate.