



## Poster session 3 – Wednesday 6 July

### P3.054 **Background mitigation in the PROSPECT short-baseline reactor experiment and other surface detectors**

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*on behalf of PROSPECT collaboration*

PROSPECT, the Precision Reactor Oscillation and Spectrum Experiment, is designed to both search for short-baseline antineutrino oscillations and make a precision measurement of the spectrum from a compact research reactor. The experiment, to be carried out at short baselines (7-19 m) from the Oak Ridge National Laboratory's High Flux Isotope Reactor (HFIR), will be deployed in locations with little-to-no overburden. Mitigation of reactor correlated and cosmogenic backgrounds is thus crucial. Detailed background surveys have been completed at multiple reactor sites. We will present the results of these surveys with particular attention to the general features of reactor sites. Monte Carlo studies validated with surface measurements have allowed a detailed understanding of the mechanisms through which cosmogenic backgrounds mimic antineutrino interactions and how they differ from experiments with greater overburden. Methods of addressing these backgrounds in surface detectors through shielding, particle identification, and optimized timing and topological cuts will be described. Specific design features of PROSPECT will be discussed.