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Analysis Strategies for the Updated Geoneutrino Measurement with Borexino:

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Borexino is a 280-ton liquid scintillator detector located at the Laboratori Nazionali del Gran Sasso (LNGS), Italy. It measures antineutrinos via the Inverse Beta Decay reaction and is one of the two detectors that has measured geoneutrinos so far. The updated statistics and the improved analysis techniques have led to a precision of around 18%. The new analysis adopts an enlarged fiducial volume, sophisticated veto for cosmogenic backgrounds, extended energy and coincidence time windows, as well as a more efficient α/β particle discrimination. The evaluation of all relevant backgrounds is also of key importance. This includes reactor antineutrinos, cosmogenic ${}^9\text{Li}$ background, accidentals, (α, n) background due to ${}^{210}\text{Po}$ contamination, and the different kinds of minor backgrounds that might affect the analysis. The final geoneutrino result was obtained via an unbinned likelihood fit of the charge spectrum of prompt candidates. The main aim of this poster is to summarize the analysis strategies and the various backgrounds, that might be useful for next generation geoneutrino measurements with liquid scintillator detectors.

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