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Radiopurity Databases for Detector Development

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Content

Modern rare-event search experiments are developed in iterations with years of engineering work being informed by a number of competing inputs. Every iteration of the design and the construction process must be validated to satisfy radioactivity-related background requirements. Published materials assay results and compilations such as radiopurity.org form an extremely useful starting point for initial estimates for design feasibility. Development of a real experiment requires tracking of many samples and measurements, specific batches of available materials or parts they represent, materials handling methods, analysis preparation and more. This requires a combination of database-like functionality and log-booking functionality that must be intuitive and encourage use. The experiment design process can be streamlined by convenient interfaces between the radiopurity data, Monte Carlo simulation data, and detector design models. I will present a number of general features and specific solutions used to achieve these goals, drawing largely on experience from the EXO collaborations and databases being implemented at the Center for Underground Physics, and elsewhere.

Summary

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