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Optical calibration of SNO+ EDWARD LEMING, University of Sussex, SNO+ COLLABORATION — Situated 2 km underground in Sudbury, Northern Ontario, the SNO+ detector consists of an acrylic sphere 12 m in diameter containing 780 tons of target mass, surrounded by approximately 9,500 PMTs. For SNO, this target mass was heavy water, however the change to SNO+ is defined by the change of this target mass to a novel scintillator. With the lower energy threshold, low intrinsic radioactivity levels and the best shielding against muons and cosmogenic activation of all existing neutrino experiments, SNO+ will be sensitive to exciting new physics. The experiment will be studying solar, reactor, super nova and geo-neutrinos, though the main purpose of SNO+ is the search for neutrinoless double-beta decay of Te-130. To meet the requirements imposed by the physics on detector performance, a detailed optical calibration is needed. Source deployment must be kept to a minimum and eliminated if possible, in order to meet the stringent radiopurity requirements. This led to the development of the Embedded LED/laser Light Injection Entity (ELLIE) system. This talk provides a summary of the upgrades to from SNO to SNO+, discussing the requirements on and methods of optical calibration, focusing on the deployed laserball and ELLIE system.

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