Poster session 1 - Monday 4 July

P1.085 **TPB thickness and quantum efficiency measurements for the new Icarus T600 light detection system in the SBN project**

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The SBN Program goal is to investigate a class of experimental anomalies in neutrino experiments and to perform a sensitive search for sterile neutrinos at the eV mass scale through both appearance and disappearance oscillation channels. The SBN consists of three Liquid Argon Time Projection Chamber (Lar TPC) detectors developed in a European – USA collaboration and located along the Booster Neutrino Beam (BNB) at Fermilab.

Icarus T600 is the SBN far detector; it was the first large scale LAr TPC to be exposed to a neutrino beam and the largest existing LAr TPC for neutrino physics.

The Icarus T600 three dimensional reconstruction of a ionizing event is achieved by combining the wire/drift coordinates on each of the three planes at a given drift time. The determination of the absolute time of a ionizing event is obtained by the detection of the scintillation light (VUV photons, $\lambda \approx 128$ nm) produced in LAr and due to the radiative decay of excited molecules Ar_2^*. To this purpose, arrays of Photo Multiplier Tubes (PMT) are going to be installed behind the wire planes.

The PMTs sensitivity to VUV light photons is achieved by a coating of a wavelength shifter organic material, the Tetra-Phenyl-Butadiene (TPB) on their sensitive glass window.

The TPB coating is obtained by means of a thermal evaporation system consisting in a copper cell (Knudsen cell) inside a vacuum chamber. To ensure the best thickness uniformity on the PMT's glass, a rotating support has been realized; to this purpose, tests were carried out at CERN on a PMT mockup to reconstruct the coating thickness as a function of the distance from the PMT window centre. Then, Quantum Efficiency tests were performed in Pavia by means of an optical device to define the best coating thickness and evaporation time (rate) as a function of the relative Quantum Efficiency value.