

# The photo-detection system and double calorimetry in DUNE

*Friday, 19 July 2024 20:40 (20 minutes)*

The Deep Underground Neutrino Experiment (DUNE) comprises a suite of Near Detectors and Far Detectors based on the Liquid Argon TPC technology, enhanced by a powerful Photon Detection System (PDS) that records the scintillation light emitted in Argon. Besides providing the timing information for an event, photon detectors can be used for calorimetric energy estimation.

The two observables generated from energy depositions by particles in liquid Argon are charge and light. The visible energy could be estimated using the charge alone. However, only electrons escaping recombination reach the wire planes, so corrections must be applied for this loss. Charge and light are anticorrelated and their sum is directly proportional to the total energy deposited: the advantage of using both is that the correction for recombination is no longer necessary. I will present an overview of DUNE PDS and the results obtained for calorimetric analyses in the DUNE detectors by combining charge and light.

## Alternate track

### I read the instructions above

Yes

**Primary author:** BRUNETTI, Giulia (Universita & INFN, Milano-Bicocca (IT))

**Presenter:** BRUNETTI, Giulia (Universita & INFN, Milano-Bicocca (IT))

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