14th Pisa Meeting on Advanced Detectors

Experimental study of the propagation of scintillation light in liquid Argon

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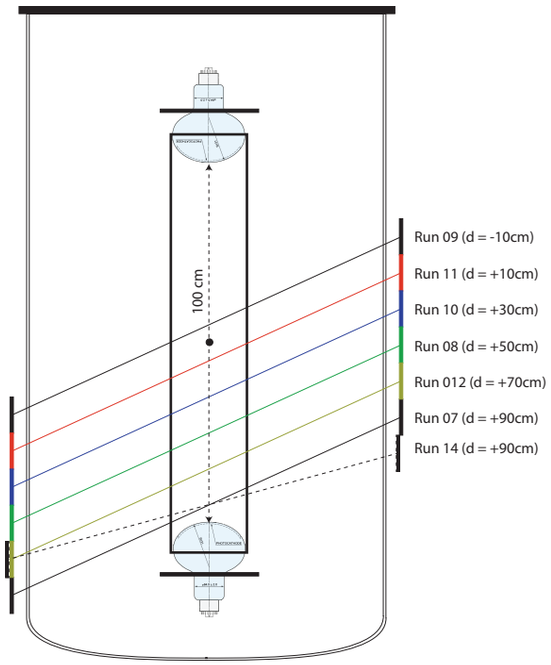
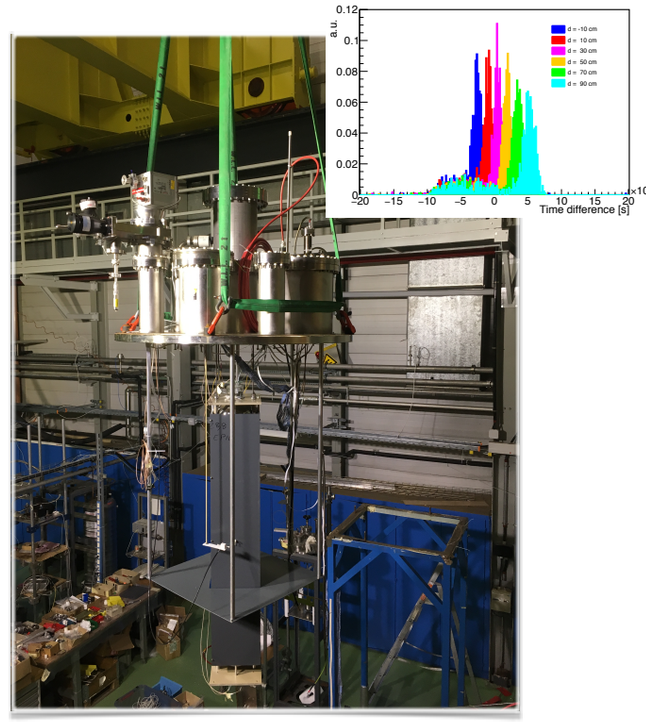
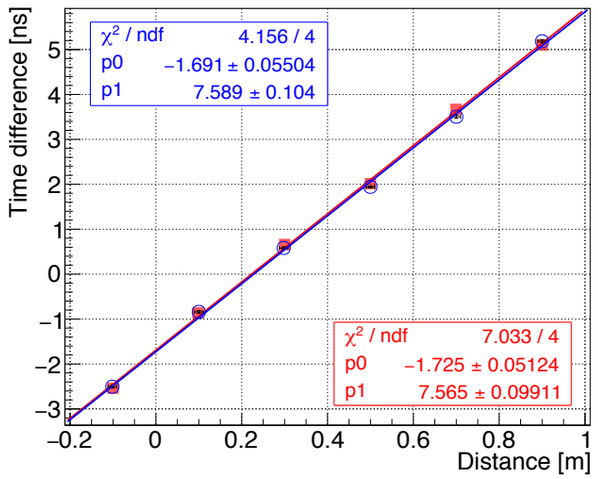
- **Aim:** improve the current knowledge of the propagation of scintillation light in LAr

Dedicated setup: two PMTs at 1m distance in LAr

- Cosmic tracks selected with an external trigger at a number of distances from the PMTs and at two inclinations
- PMT signals are recored with waveform digitisers (5GHz) and their timing determined using a software constant fraction technique
- The measurement relies only on the external trigger position. No calibration of the PMT transit time is required
- Scintillation photon velocity determined from the difference in time of the signals in the two PMTs as a function of the track position







Framework	Track sample 1 [ns/m]	Track sample 2 [ns/m]
A	7.6 ± 0.1	7.6 ± 0.1
B	7.4 ± 0.1	7.4 ± 0.1

$1/v_g = 7.50 \pm 0.07$ (stat) ns/m

From the velocity measurement, estimation of the Refractive index Rayleigh scattering length for liquid Argon at 128 nm are inferred