

Approximate cost estimation of extruded TOF counters for ND280 upgrade

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12 May 2017

Cost breakdown for the outer TOF system (over inner surface of e.m.calorimeter) (1)

Materials:

Number of sci. slabs of 0.7x20x270 cm : 304

Total sci. weight: ~1300 kg

Cost of polystyrene: **2000 \$**

Cost of paraterphenyl **7000 \$**

Labor (extrusion + manufacturing of detectors) about **5000 \$**

Total cost of scintillators **about 14000 \$**

Cost of one scintillator **about 45 \$**

Contingency 20% ??

Cost breakdown for the outer TOF system (over inner surface of e.m.calorimeter) (2)

WLS fiber 1 mm Y11 multi clad

Kuraray length (to achieve 0.6 ns resolution): 3.6 km Roughly 3.2 \$/m,
total cost **11500\$**.

Glue (2.6 g/m): $3600 \times 2.6 = 9.4$ kg. Total cost for glue ~**1500\$**.

Optical Connectors: press-form for molding ~ **6000\$**

Photosensors: Number of 3x3 mm MPPCs : 304. Cost: $\sim 40\$ \times 320 =$ **12800\$**

Electronics: Number of electronic channels: 304. Assuming 100 \$/ch the digitizer,
electronics cost is **30400 \$**.