

# DUT Material budget

Material budget of the DUT cooling box's parts are presented on fig. 1 (calculation was based on the radiation lengths using the sizes of box's parts, see fig. 2).

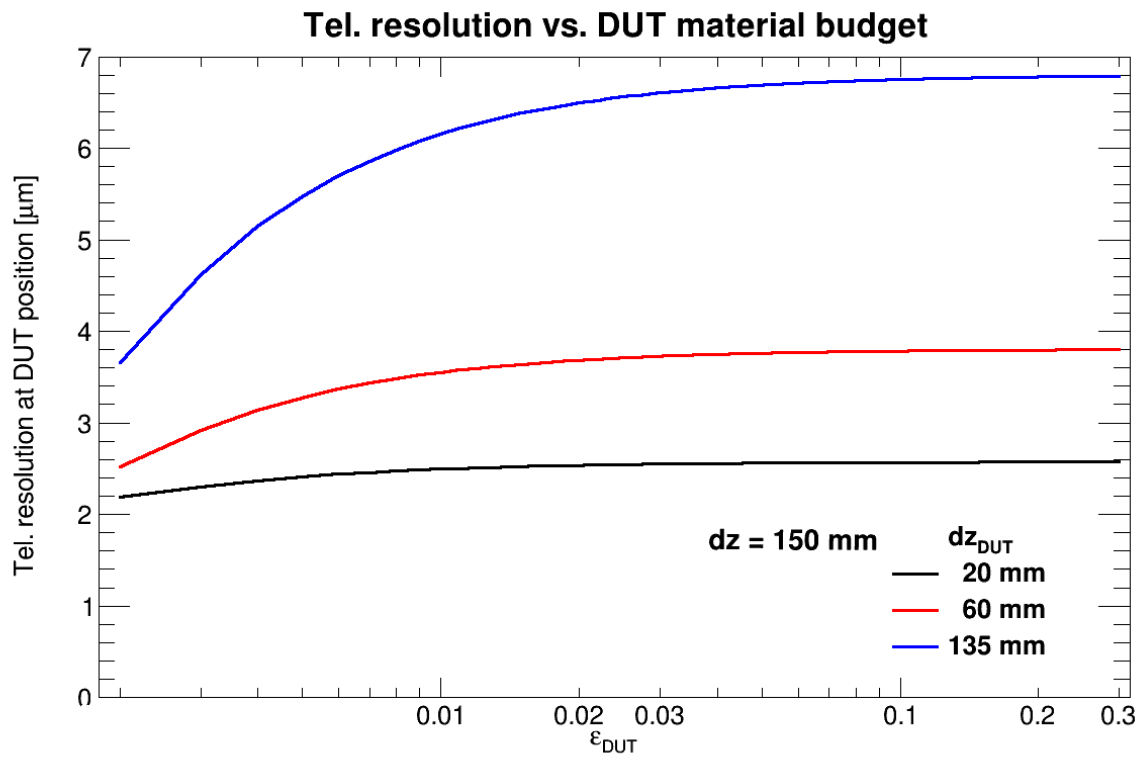


Fig. 1.1. Material budget of the DUT cooling box's parts.

Fig. 1.2. Impact of each DUT part to the total DUT

Worst case scenario (blue dots on fig. 1.1) corresponds to the material budget when beams are coming through the Cu sample holders which keep it fixed to PCB; these holders also have kapton wrapping introducing extra multiple scattering. Scattering material thicknesses for 0 deg. DUT inclination are shown as ticks to the second X axis of fig. 1.1.

The telescope resolution at the DUT position (assumed to be the middle between the tel. arms) is presented on fig. 3.



*Fig. 3.* Tel. resolution at the DUT position vs. DUT material budget (tel. planes spacing is ~150 mm, distance between DUT and PI2/3 is ~135 mm).

Kapton info: [DEC-Kapton-summary-of-properties.pdf](#)

Armaflex info: [armaflex.pdf](#)

R script for calculation: [rad\\_length\\_calculator.R](#)

Tel. resolution vs. DUT material budget: [track\\_res\\_vs\\_DUTeps.root](#)