Cerenkovs in new geometry & magnet configuration

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HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY.

Overview

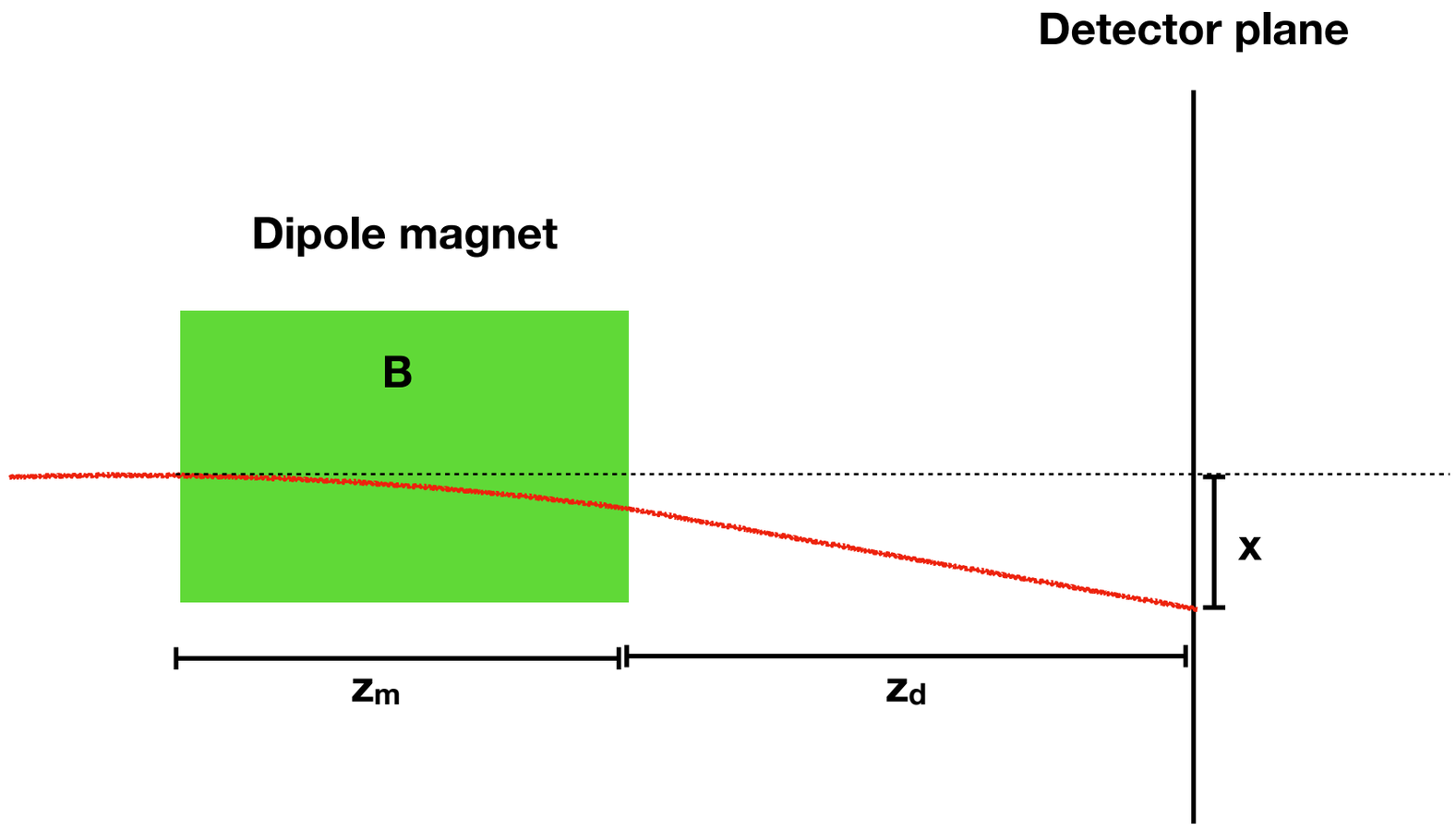
BEFORE:

- foresaw 2 run modes: 2T B-field for edge measurement and 1T B-field for Tridents
- magnet length 1.03m, Cerenkovs 1.69m behind the B-field, 1.5mm segmentation
- needed to shift the setup

NOW:

- can we merge the 2 run modes using 1.5T B-field and pushing the Cerenkovs further back from the B-field
- magnet length 1.2m, Cerenkovs 3.2m behind the B-field, 3mm segmentation
- can we still measure edges?

Dipole Geometry & Parametrization

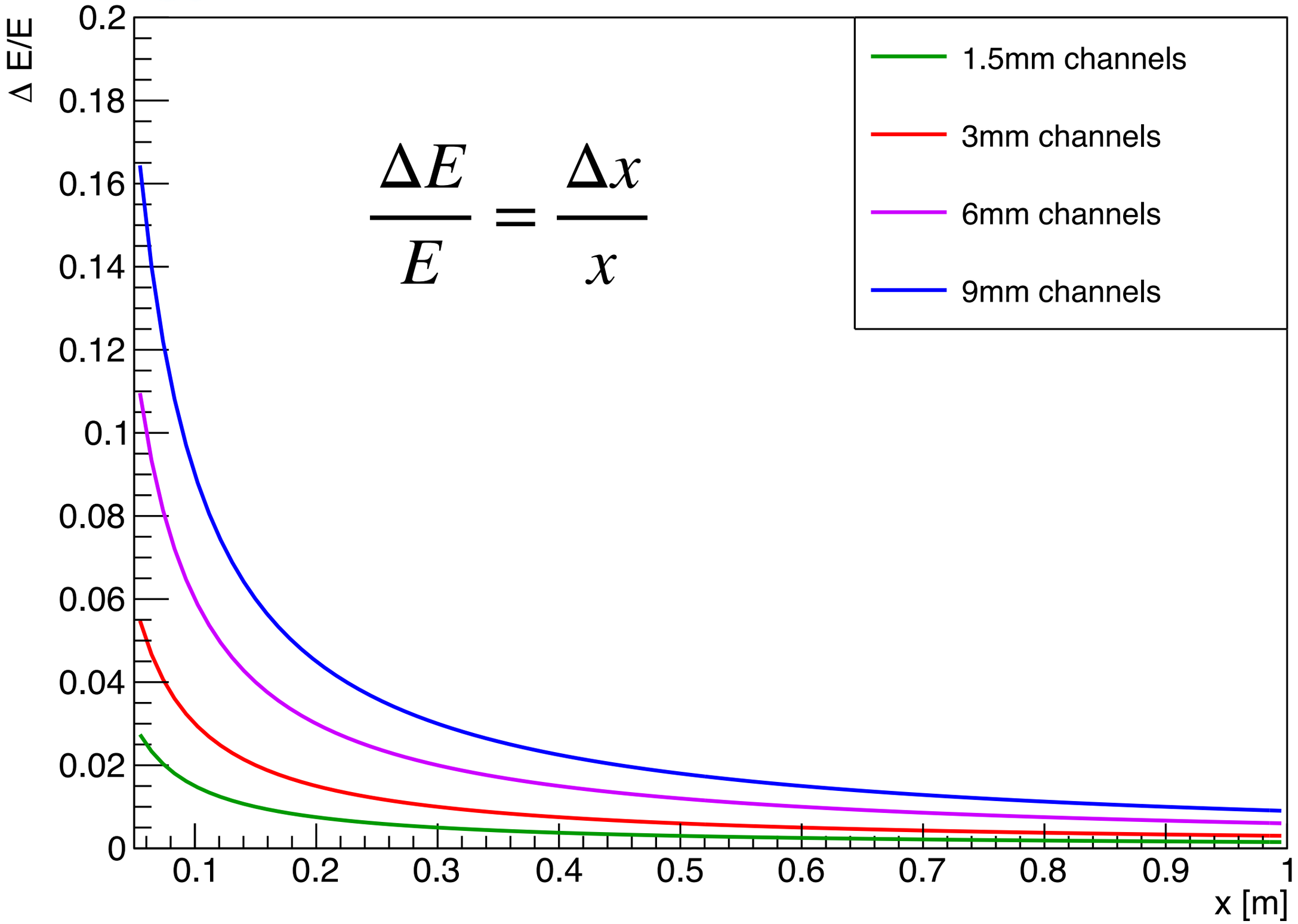


$$x/\mathrm{m} \approx 0.3 \cdot B \cdot z_m \cdot \left(\frac{z_m}{2} + z_d\right)\frac{\mathrm{GeV}}{E}$$

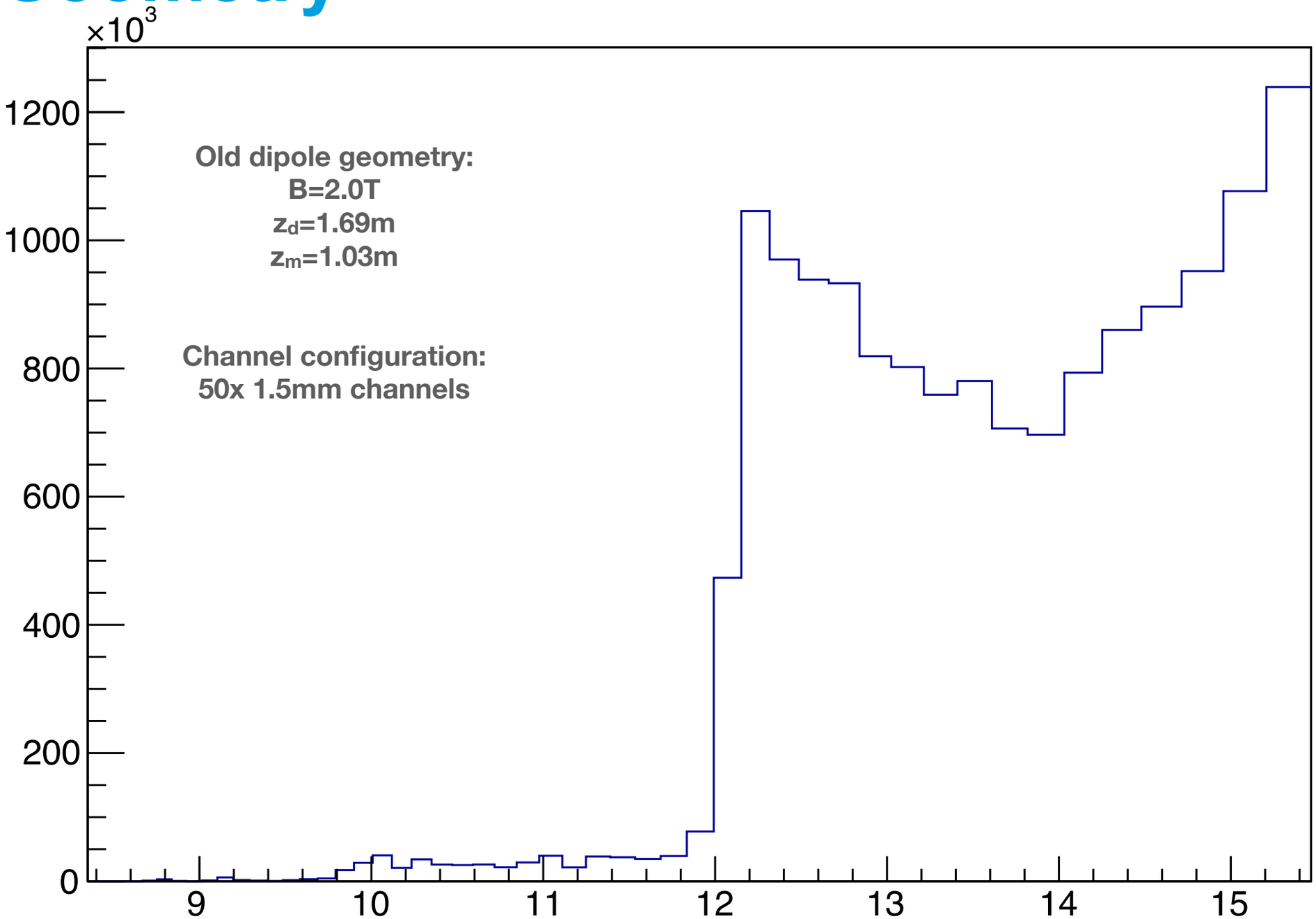
	beam	max acc.	min acc.
Energy	16.5	15.3 GeV	3 GeV
position	12.4 cm	13.4cm	68cm

Energy resolution vs x

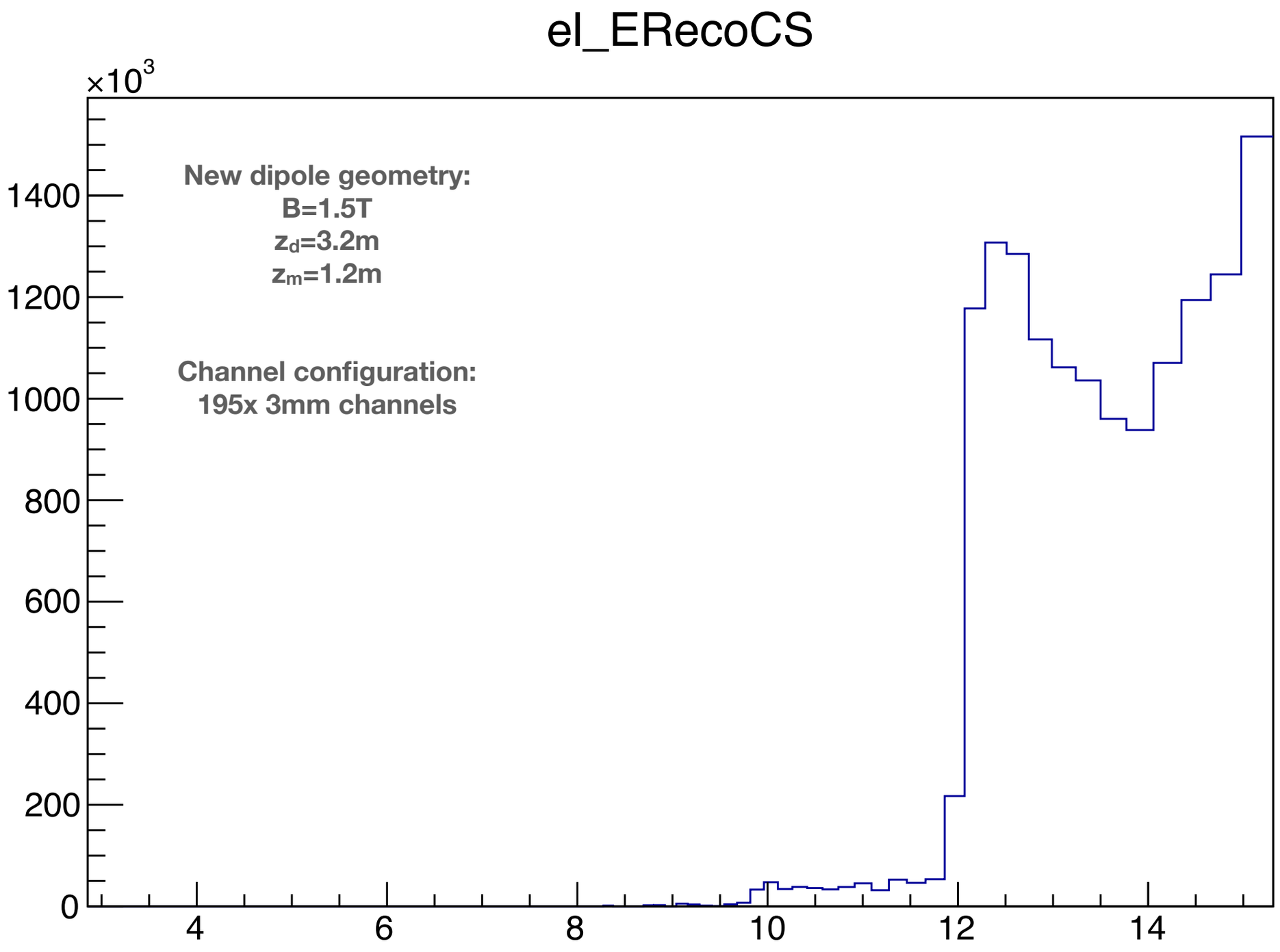
$$\frac{\Delta E}{E} = \frac{\Delta x}{x}$$



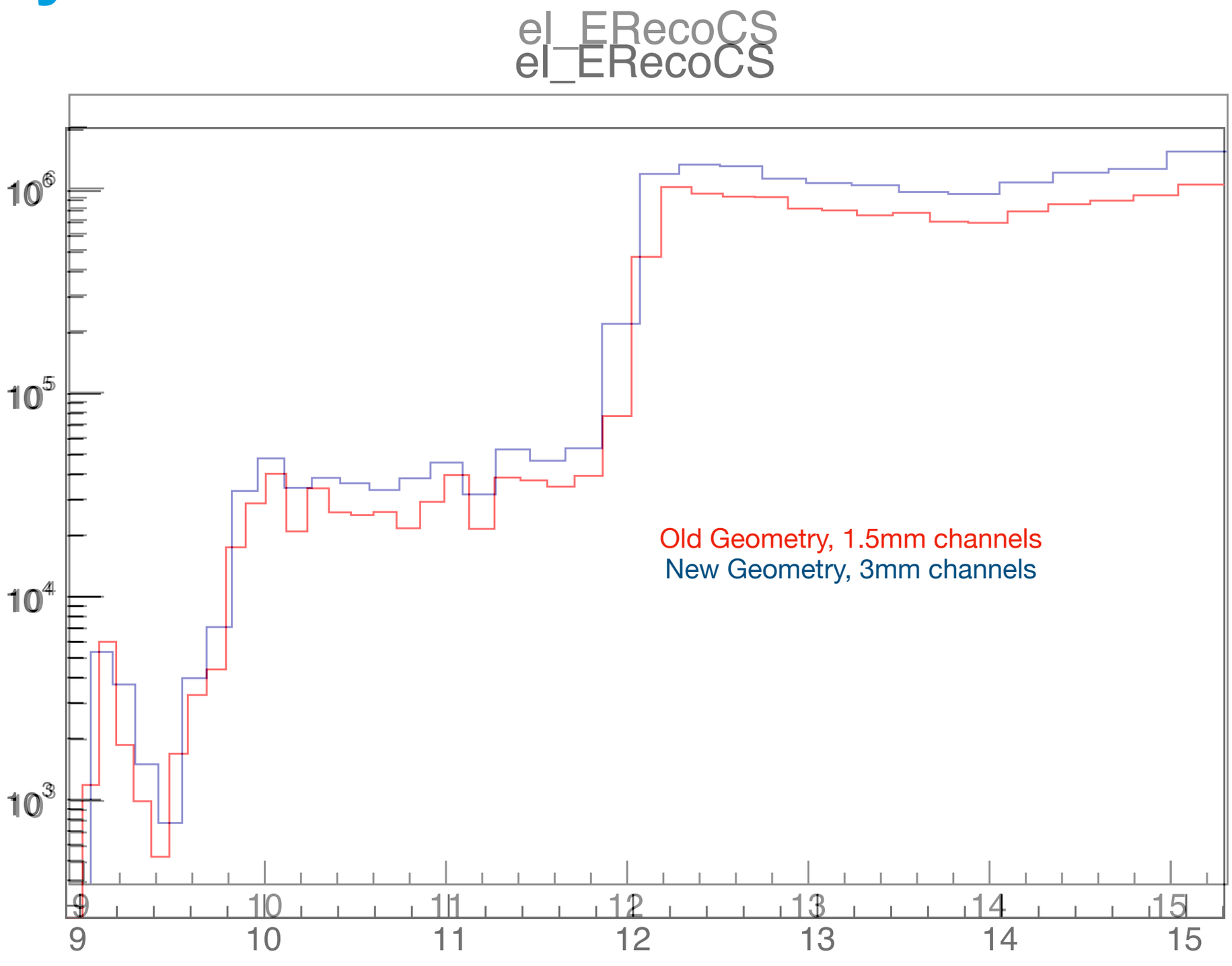
“Old Geometry”



“New Geometry”



Overlay



Resolution seems sufficient even with 3mm channels to measure edges in new configuration!