BGO for neutron detection in FOOT

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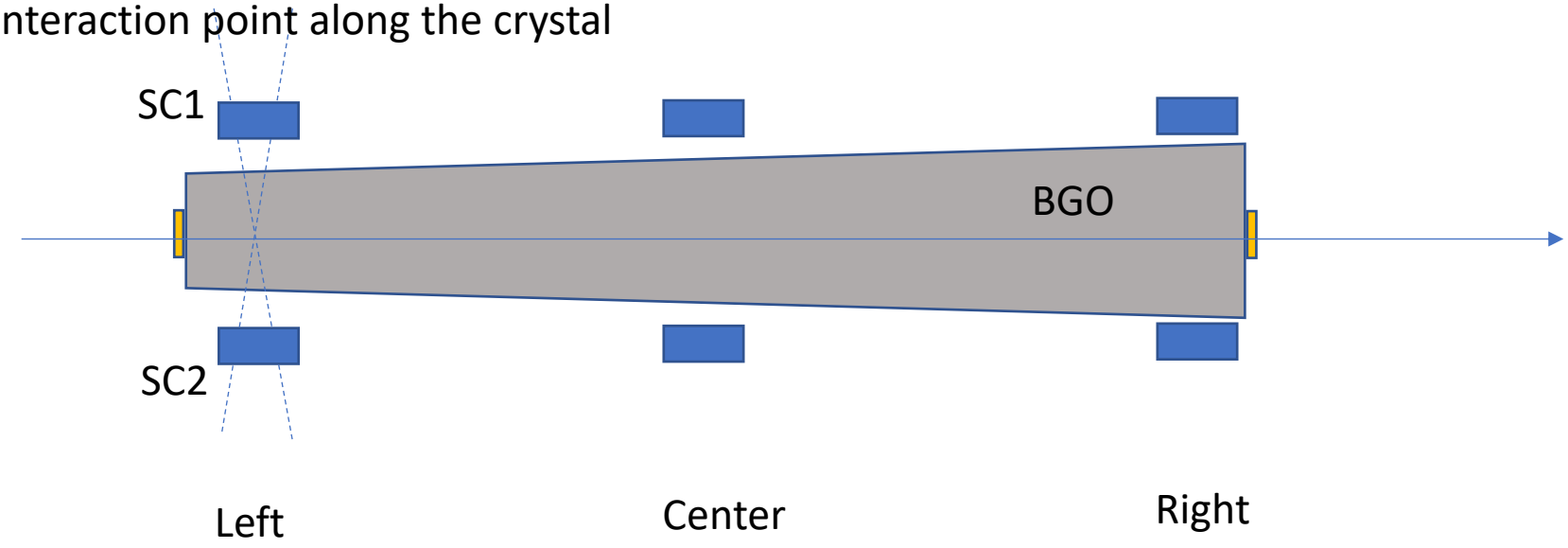
Setup

- **Goal**: investigate the possibility to assess the interaction point inside the BGO to discriminate neutrons (PRIN)

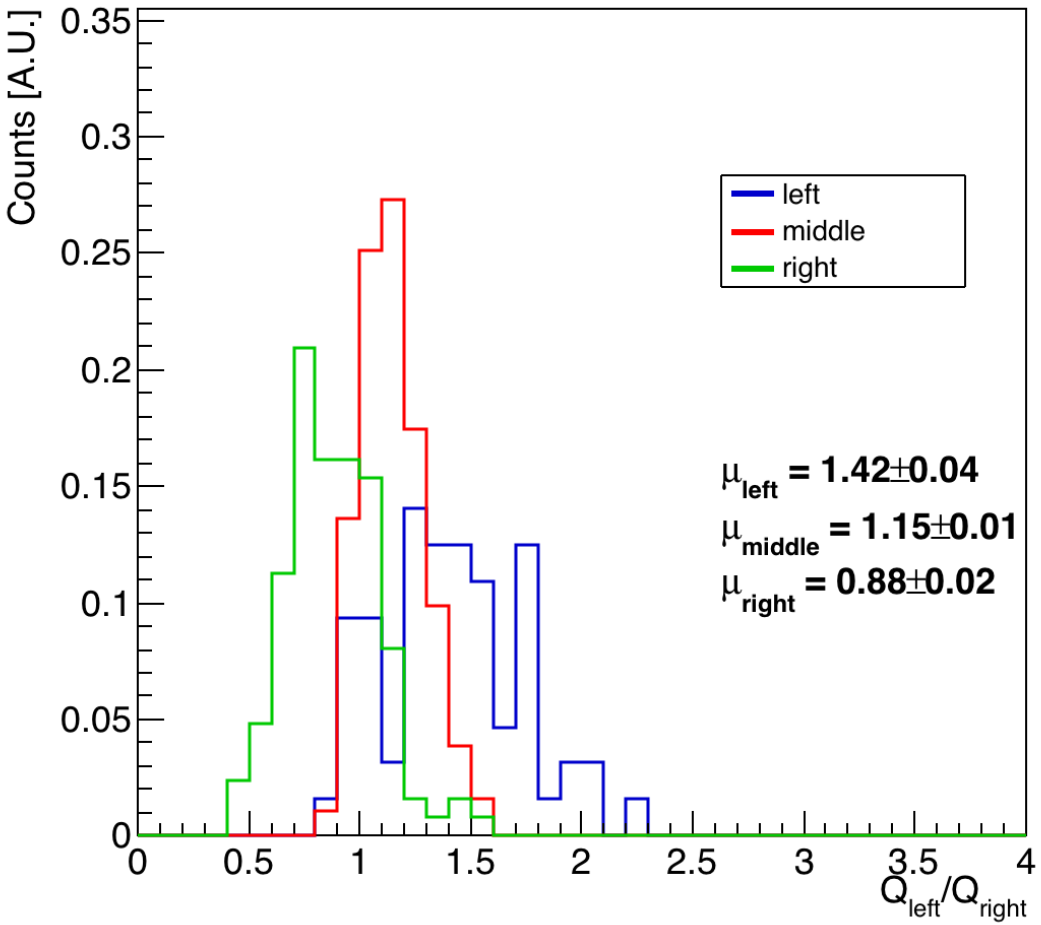
- **Idea**: measure the charge Left-Right asymmetry as a function of the cosmics interaction point along the crystal



- Setup: **BGO crystal** with white reflective paint coat + 2 **plastic scintillators** 1x1 cm^2 to trigger cosmics

- **SiPM** read-out (AdvanSid NUV 3SP), 3x3 mm^2, (QE not optimised for BGO), bias set “at maximum”. Read-out performed with the WaveDAQ system @ 2GS/s

Results



- We looked at ther ratio Qleft/Qright (comment: this is not the only quantity that can be used…)
- A ratio dependency wrt the interaction point in the crystal can be observed
- Assuming a linear behaviour, it translates in a spatial resolution of 7cm (with this setup)
- Assuming also full cover of the BGO face, it means a ~ 2 cm resolution