

# TUS optical system and trigger electronics symulation

A. A. Grinyuk

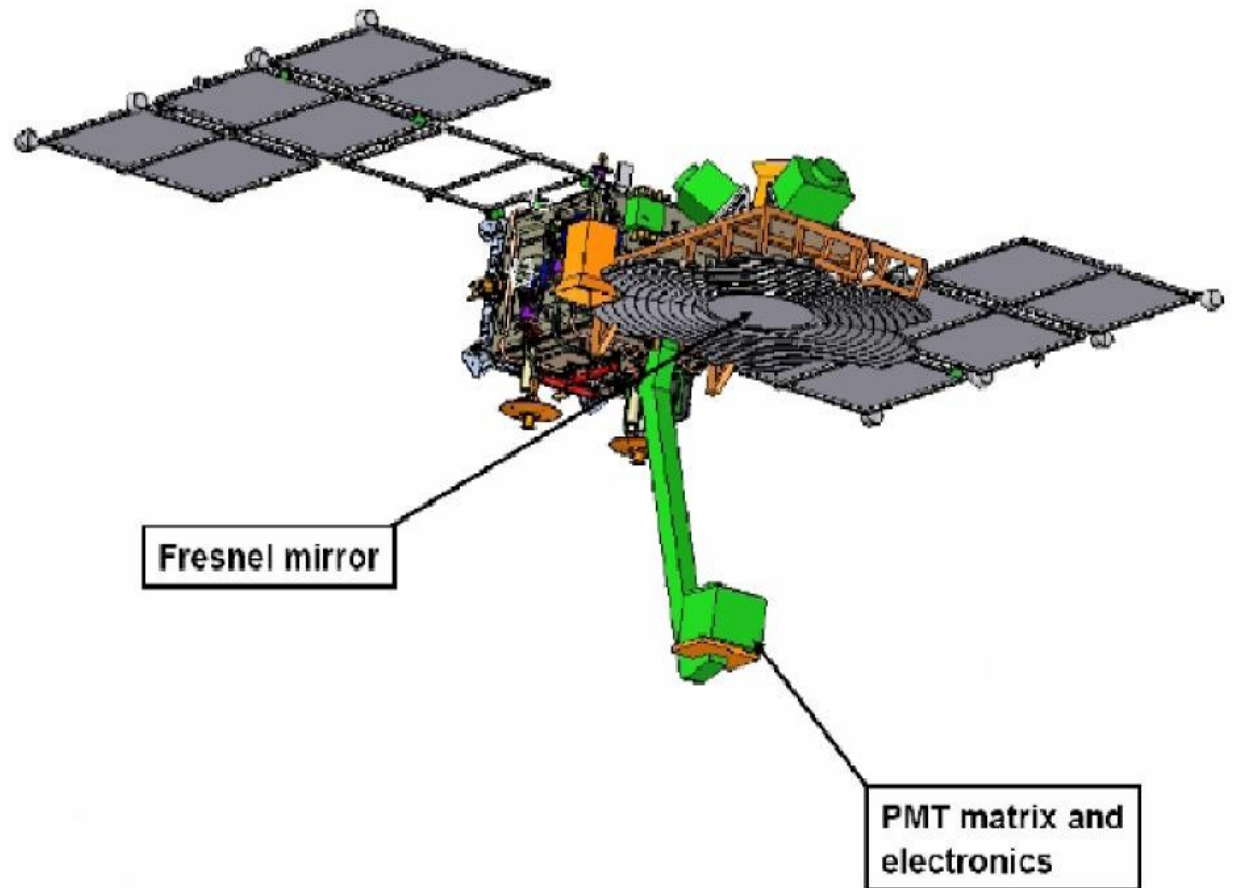
A. V. Tkachenko

L. G. Tkachev

JINR, Dubna

# «Mikhail Lomonosov» satellite

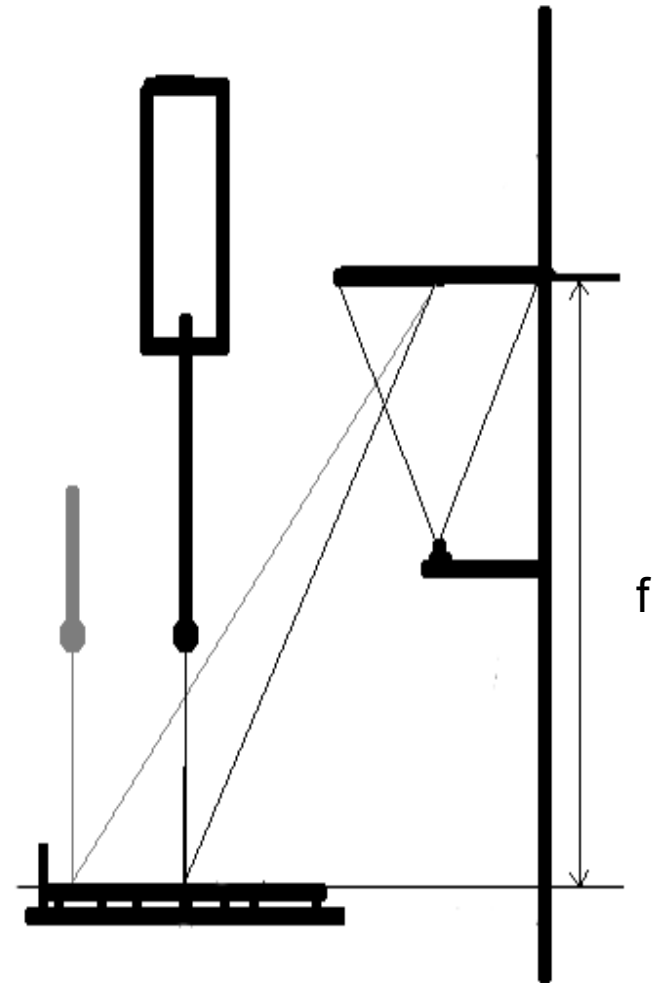
Total mass: ~200 kg  
Orbit height: 550-400 km  
Launch time: 2013  
Duty cycle: 3 years



# Measurements of mirror optical parameters

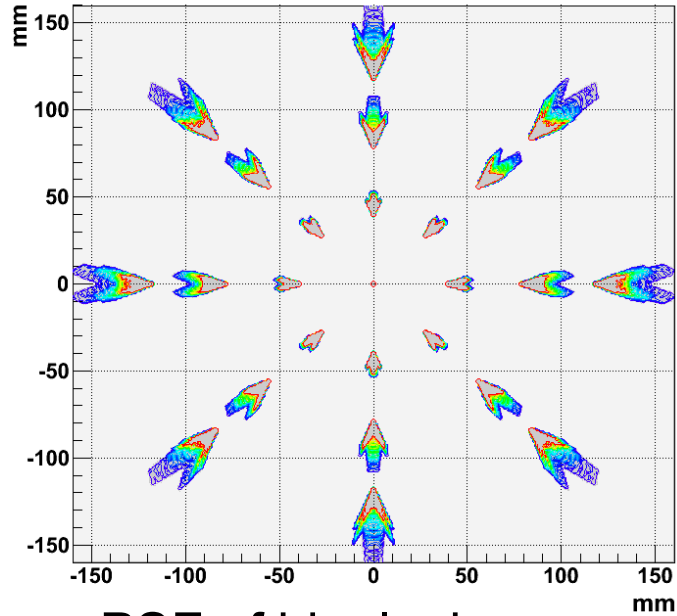


Photo of measurement equipment

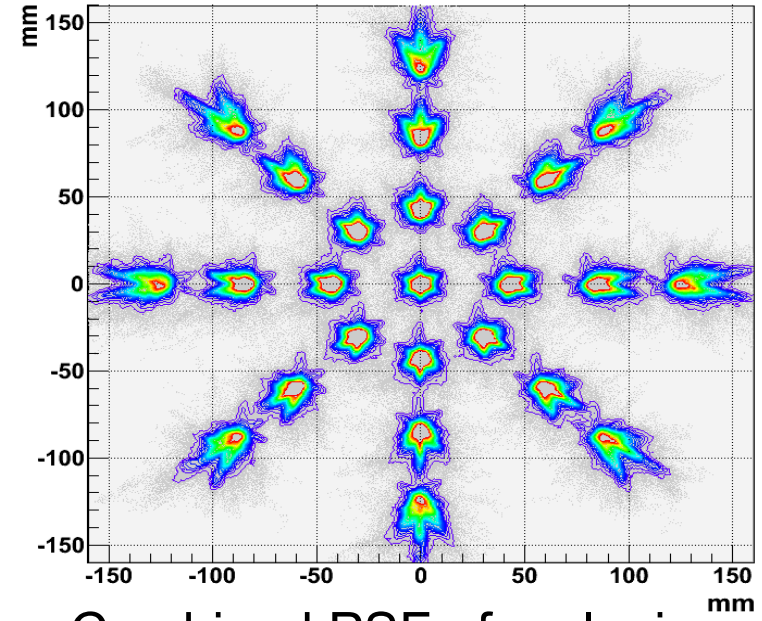


Schematic diagram of measurements

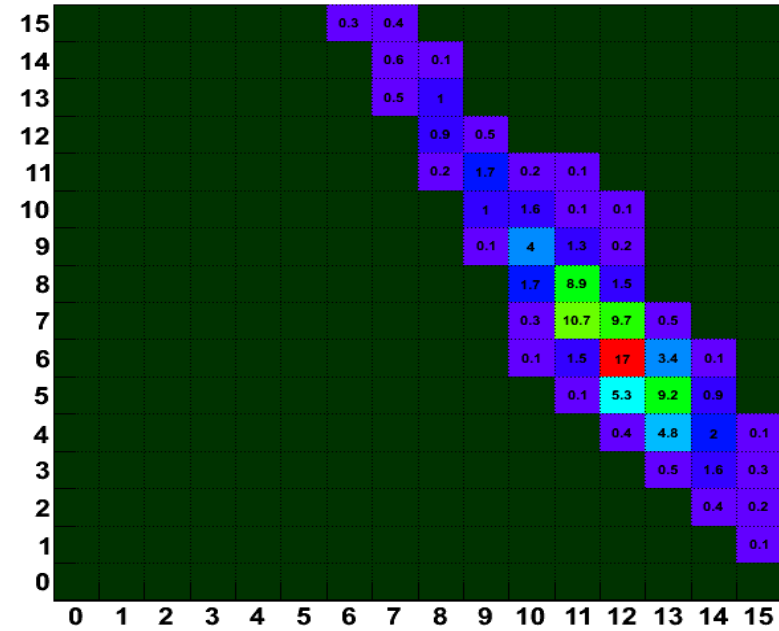
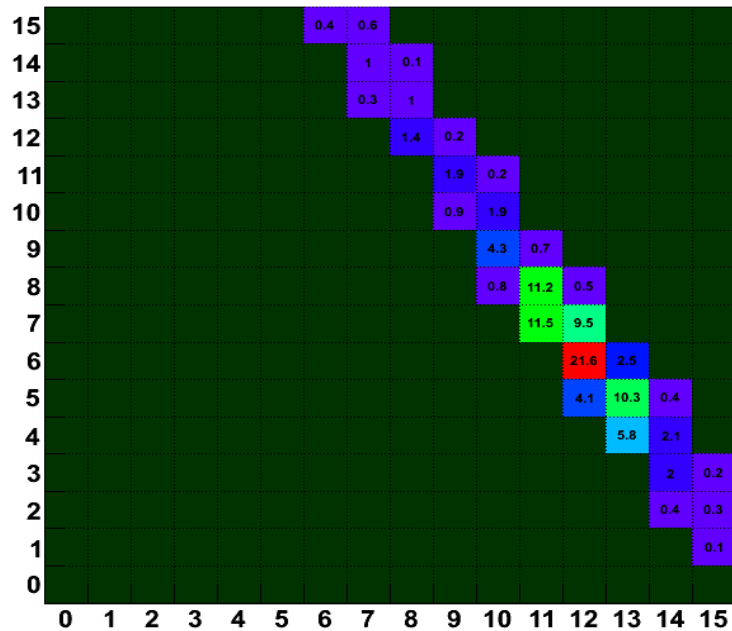
# Results of optical simulation



PSF of ideal mirror

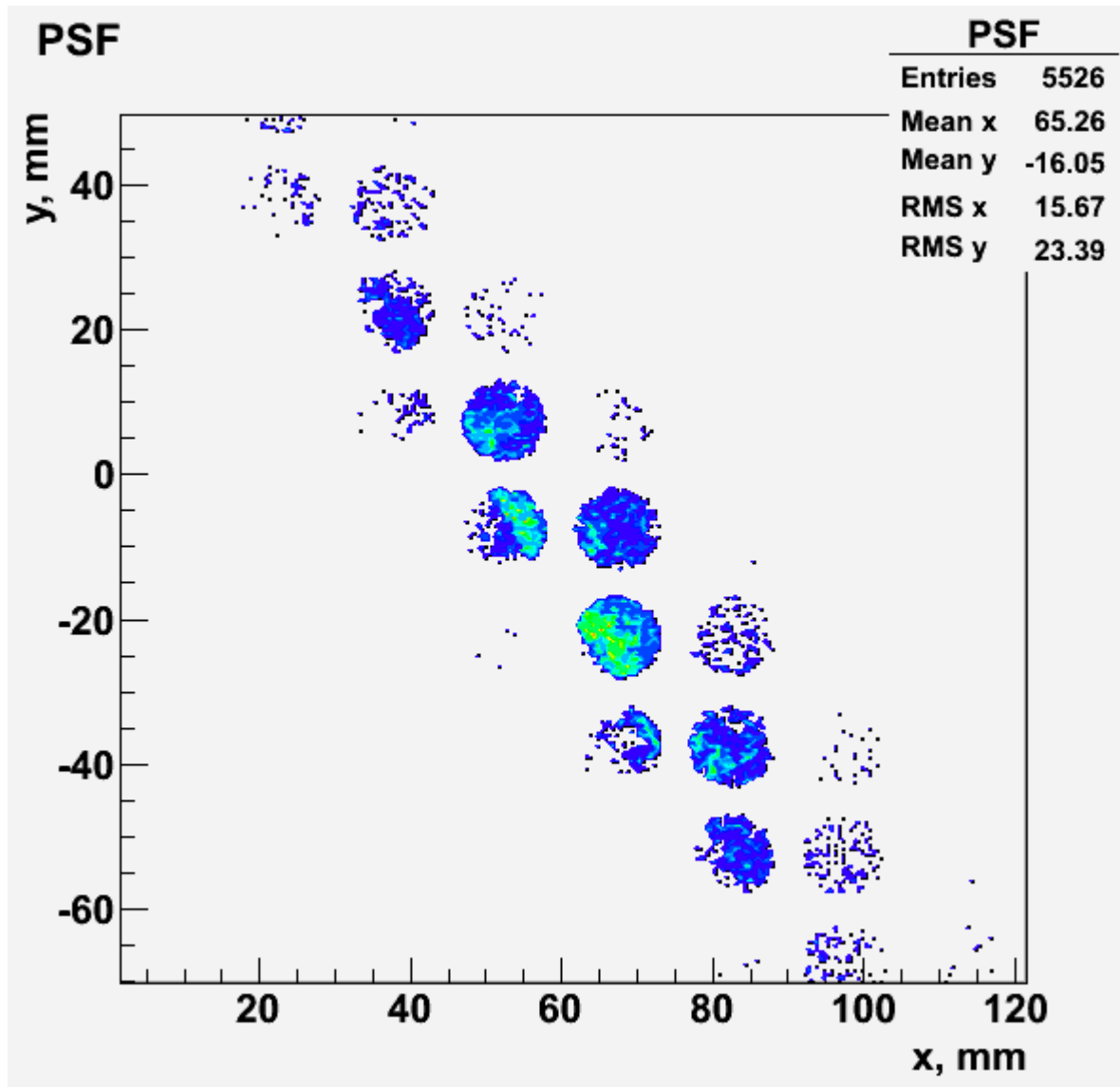


Combined PSF of real mirror

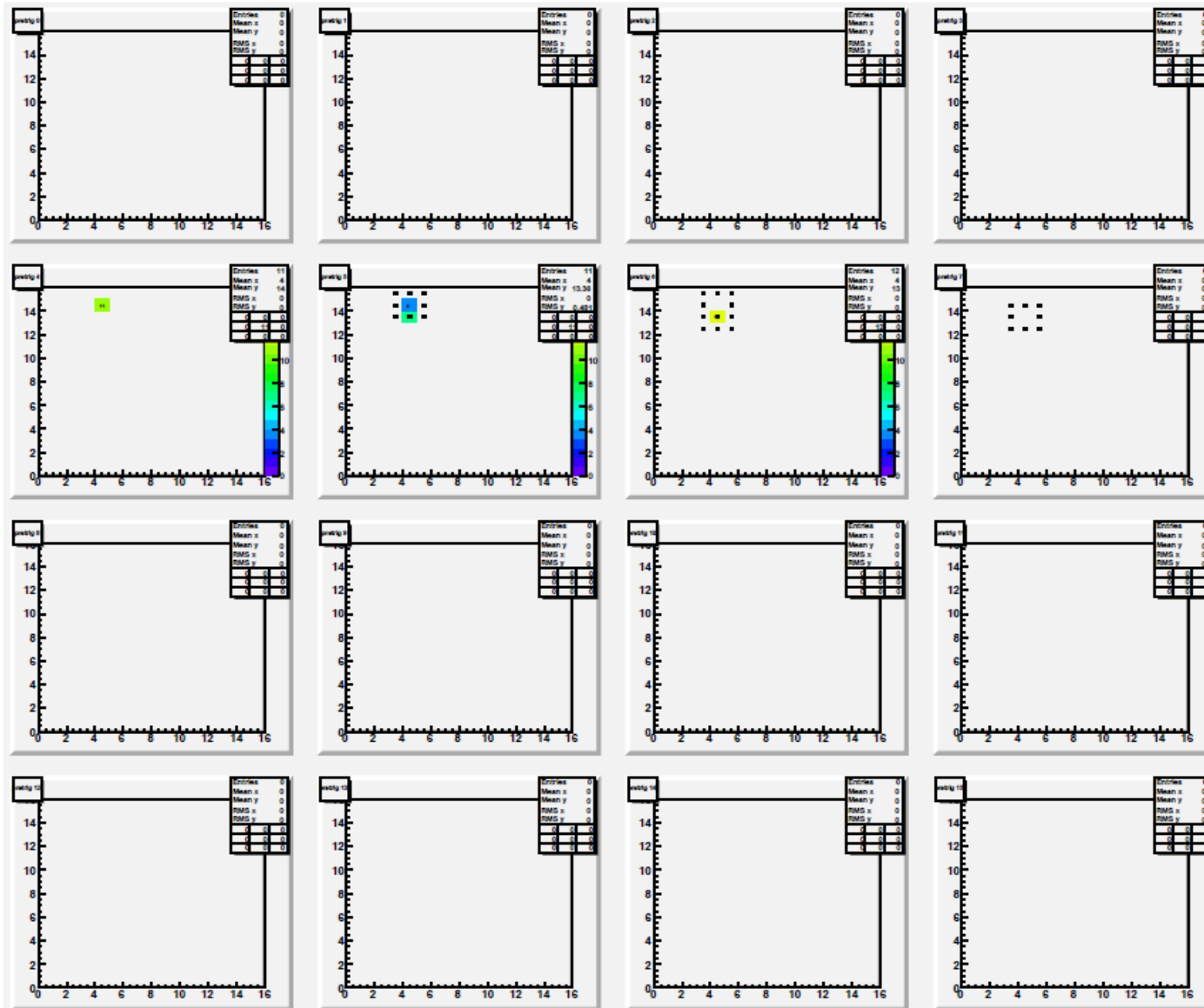


Photons from the same event on the PMT matrix simulated with ideal and corrected optics

# Example of a good event

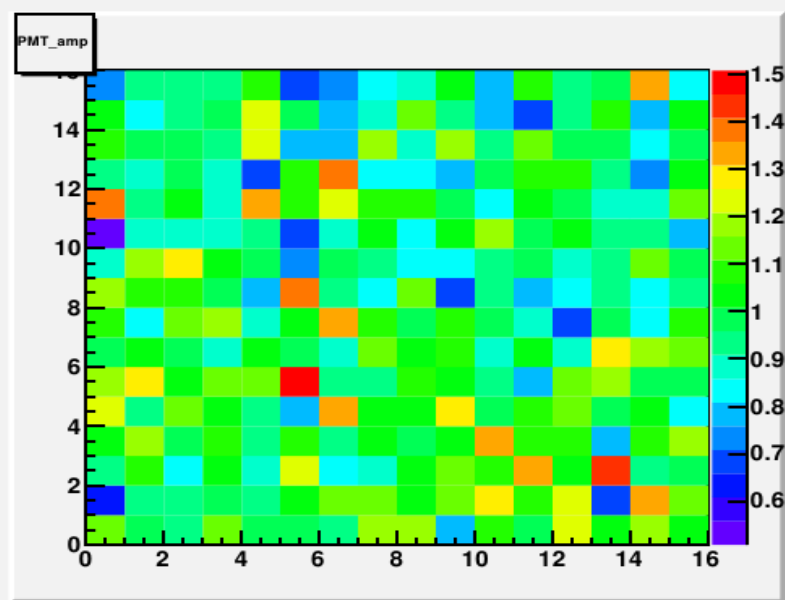
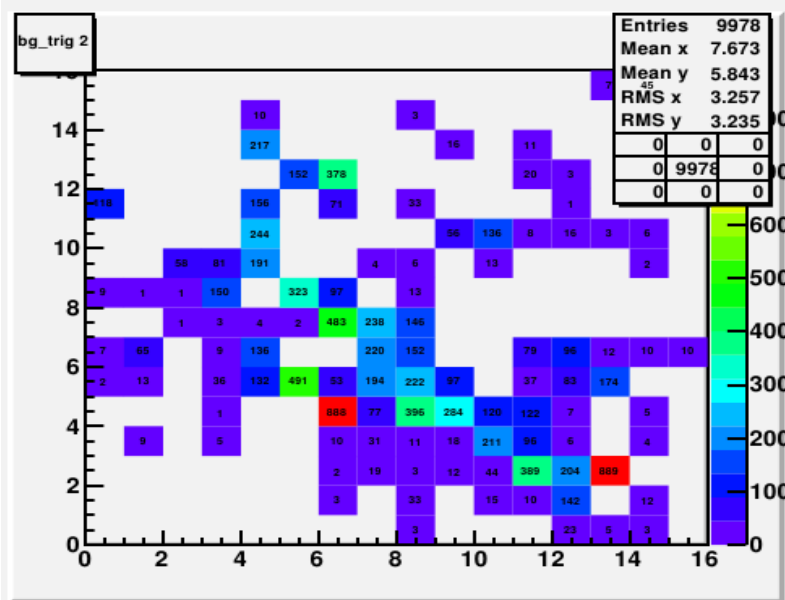
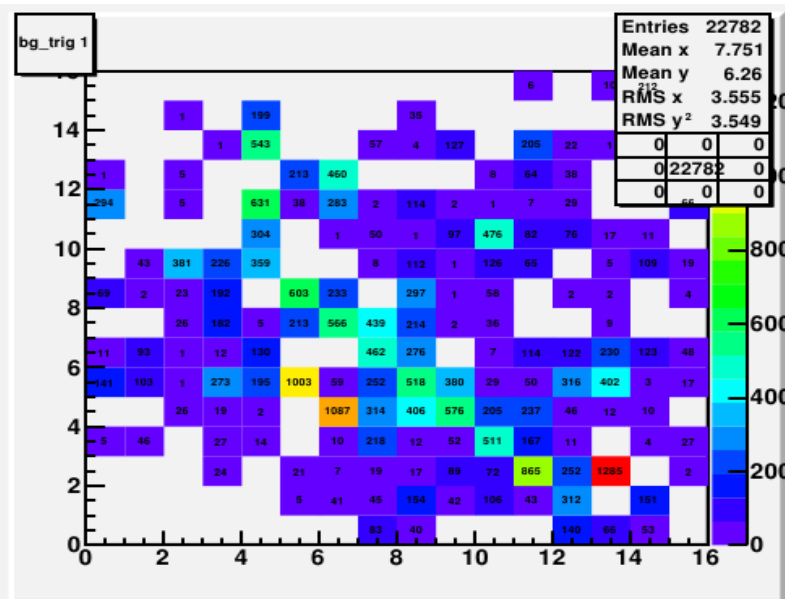
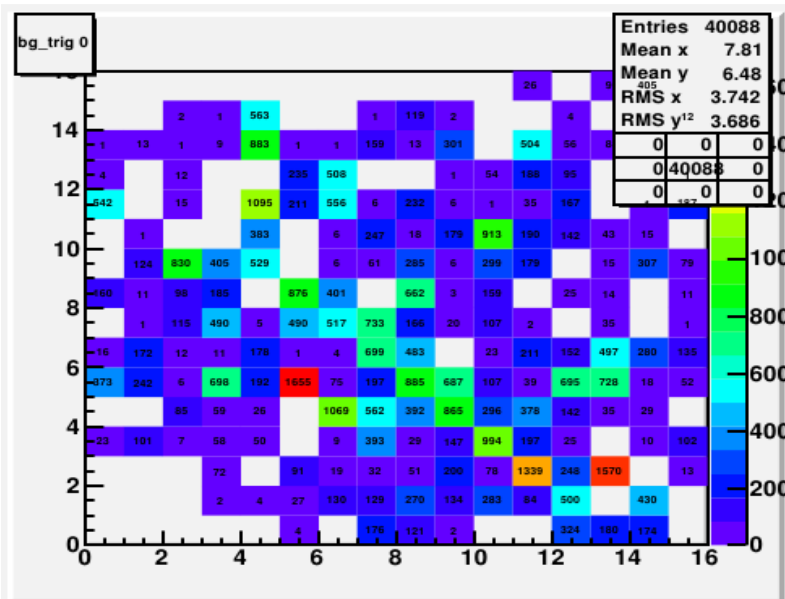


Photons on the surface of photo-cathodes

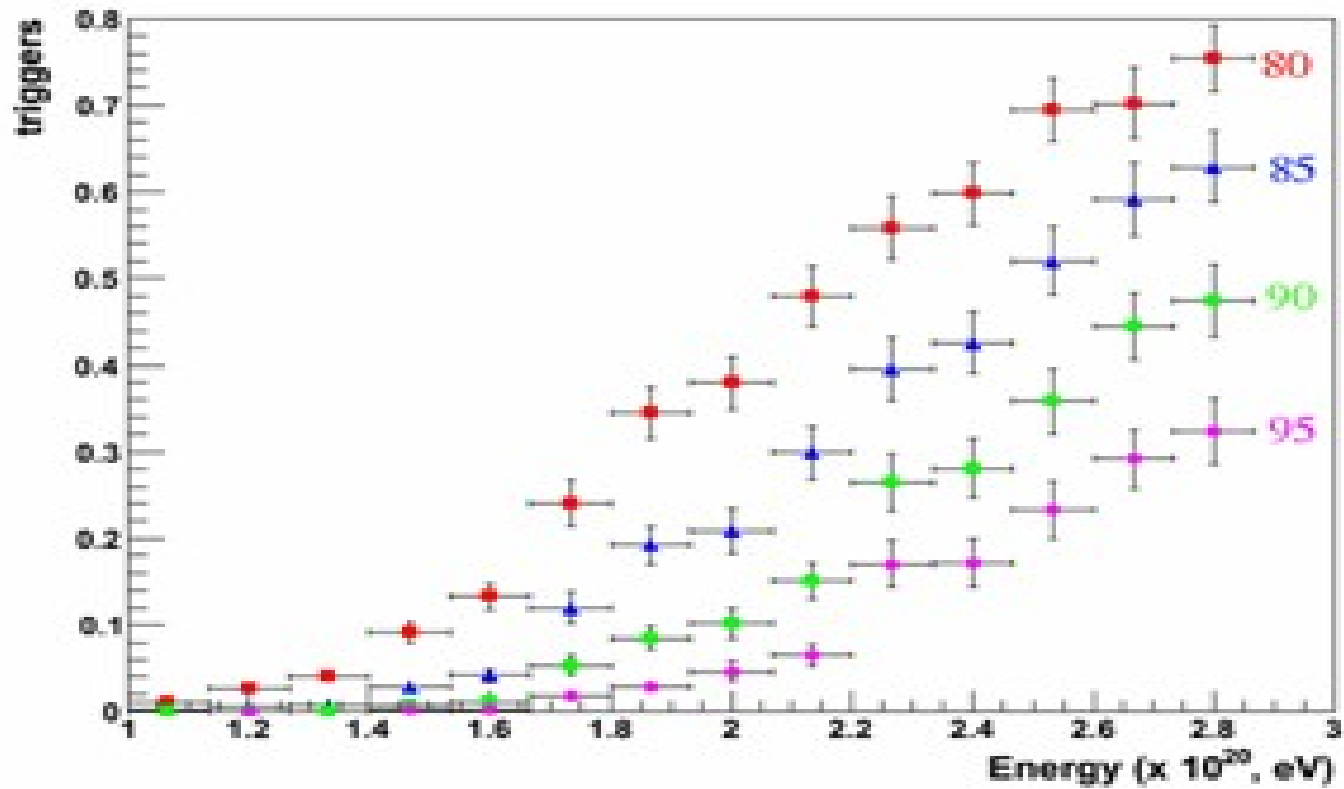


Second level trigger generation

# Simulation of electronics



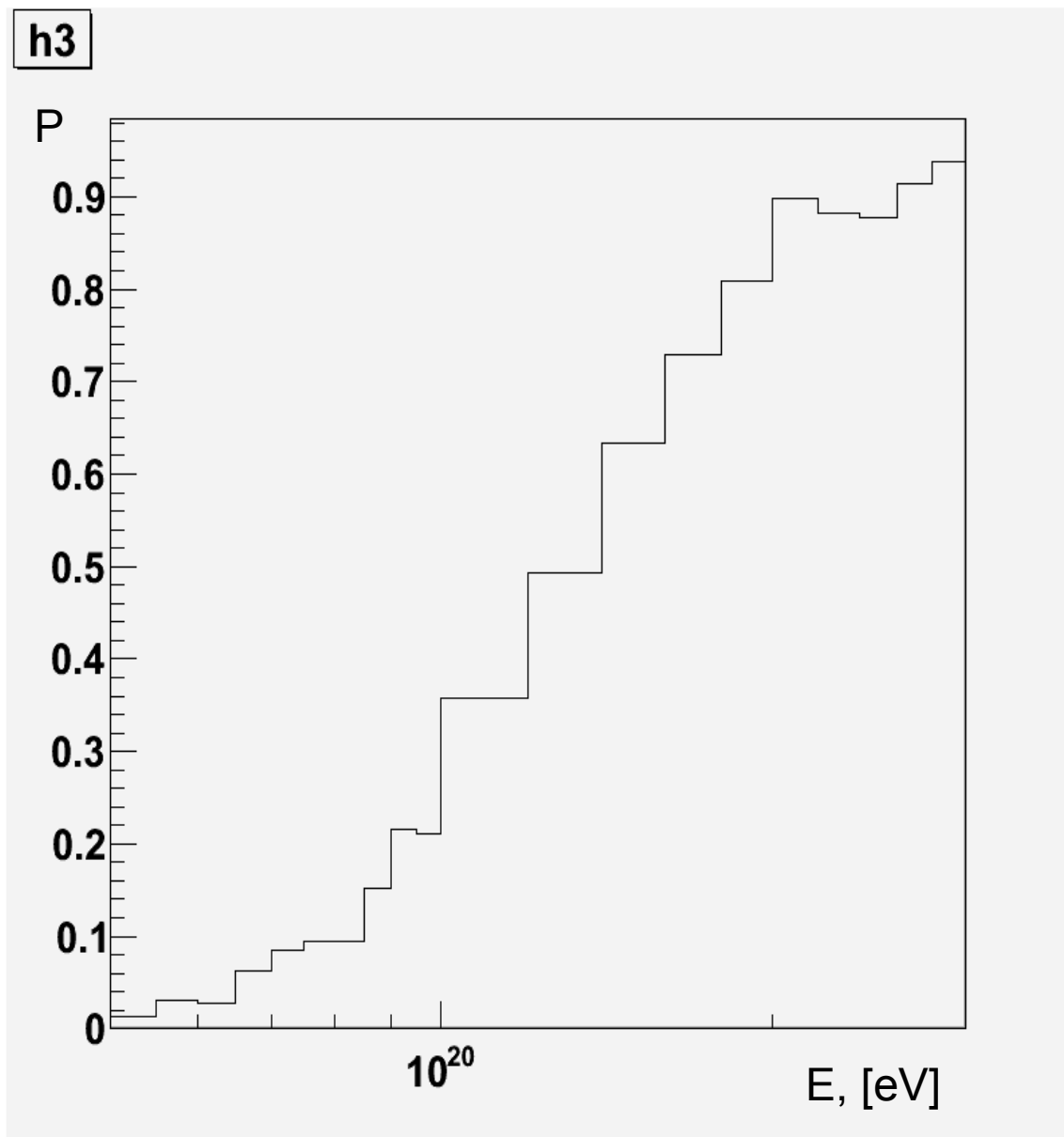
Second level trigger generation ratios on mostly background and measured PMT gain coefficients



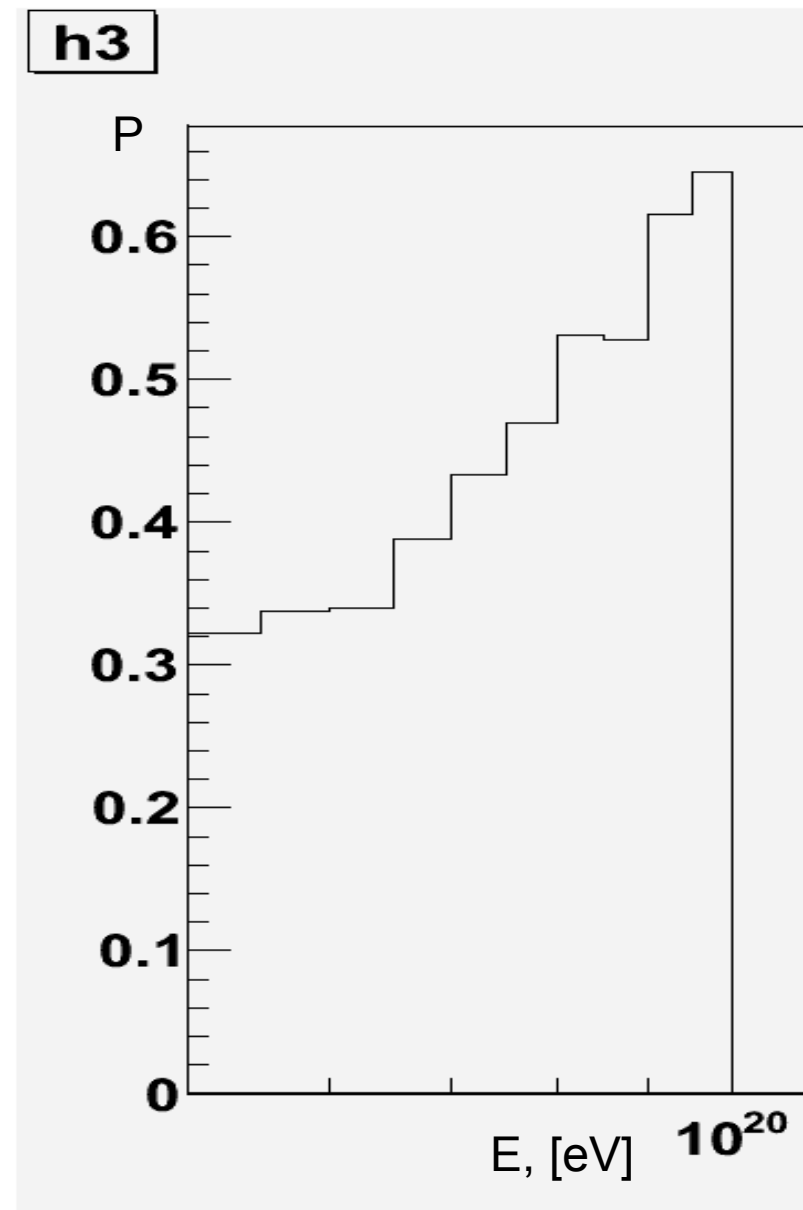
Simulated trigger efficiencies with uncorrected real PMT gains



# Shower detection efficiency



3-coincidence scheme



2-coincidence scheme