

# Development of the Double Cascade Reconstruction Techniques in the Baikal-GVD Neutrino Telescope

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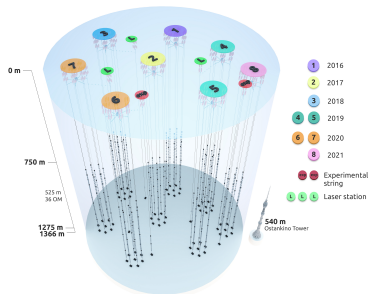
on behalf of the Baikal-GVD Collaboration  
Comenius University in Bratislava, Slovakia

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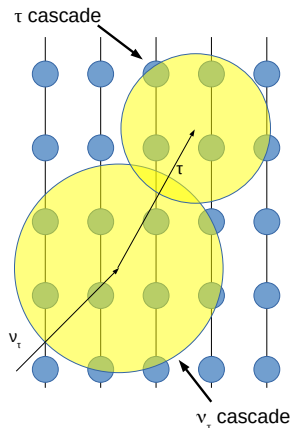
# Baikal Gigaton Volume Detector (Baikal-GVD)

- neutrino telescope installed at the depth of  $\sim 1300$  m in the deepest freshwater lake in the world Lake Baikal
- basic independently working unit  $\rightarrow$  cluster
- a cluster consists of 288 Optical Modules (OMs) arranged in 8 strings = 36 OMs on each string
- OM consists of photomultiplier tube enclosed in a pressure-resistant glass sphere
- current status - 8 clusters are deployed  $\Rightarrow$  2304 OMs  $\Rightarrow$  effective volume  $\sim 0.4 \text{ km}^3$



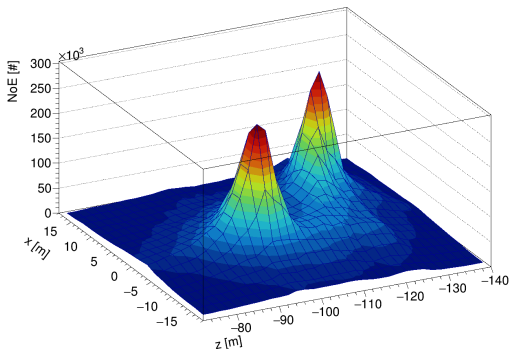
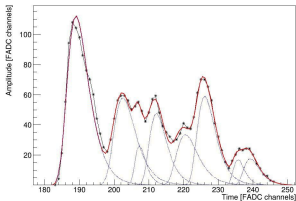
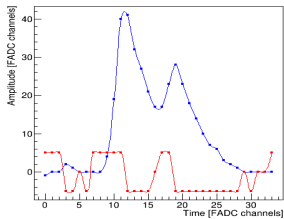
## Charged current interaction of $\nu_\tau$

- two types of signatures according to tau decay modes:
  - decay to muon  $\rightarrow$  single cascade signature, branching ratio  $\sim 17\%$
  - decay to electron/hadrons  $\rightarrow$  **double cascade signature**, branching ratio  $\sim 83\%$



# Double Cascade Reconstruction Techniques

- Search for double cascades with double pulses
- Single cluster double cascade reconstruction
- Multi-cluster double cascade reconstruction



Thank you for your attention.