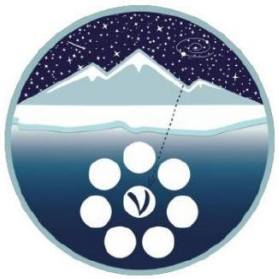

Performance of the muon track reconstruction with the Baikal-GVD neutrino telescope

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for the Baikal-GVD collaboration

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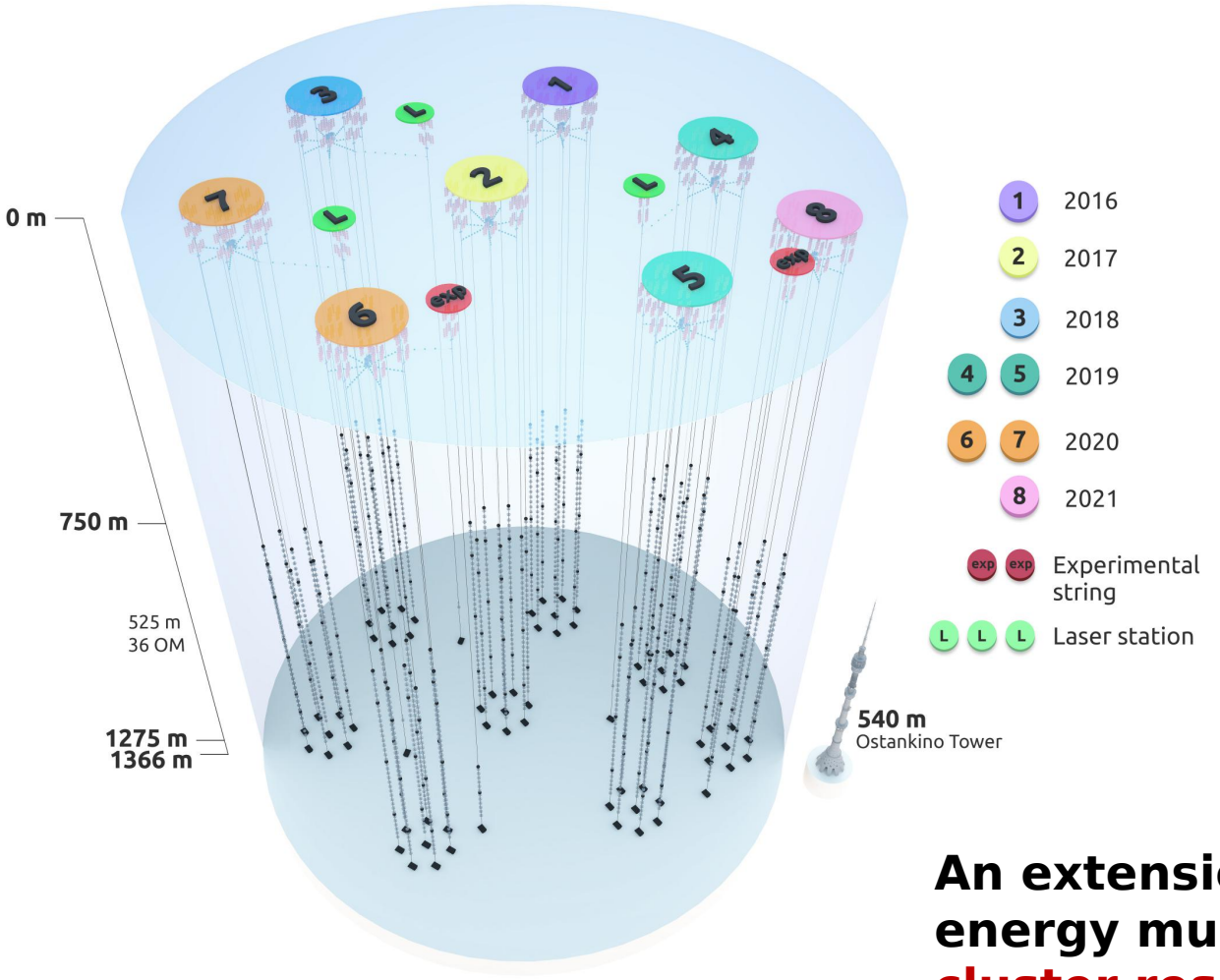
INTRODUCTION



Baikal-GVD neutrino telescope incorporates 8 clusters since April 2021

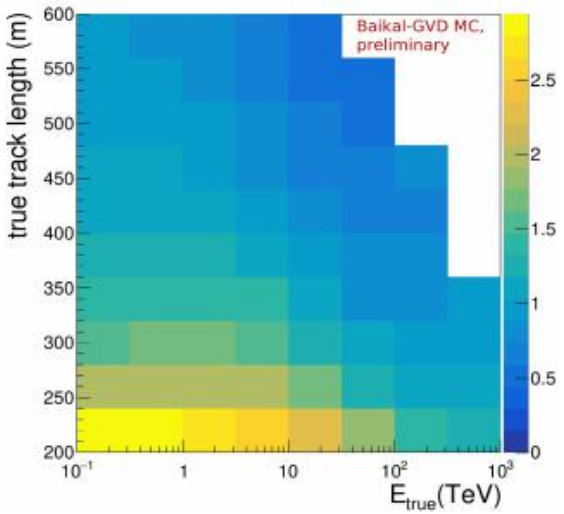
64 strings, 2304 optical modules (OM)
Effective volume for high-energy cascade detection~0.4km^3

Muon track detection channel provides the best neutrino direction mesurement (sub-degree median resolution)

Low-energy muon reconstruction was developed. A sample of 44 neutrino candidates is selected in data from April-June 2019 (see talk by Dmitry Zaborov)

An extension of muon reconstruction towards high-energy muons is discussed in this report , single-cluster resconstruction results are presented

RESULTS



Reconstruction incorporates efficient hit finding algorithm (see poster by Bair Shaybonov and Alexander Avrorin) and χ2(t)-based track fitter

Median angular resolution of 0.5-0.7° for E~100 TeV tracks with L > 300 m

Factor ~3 uncertainty for ~100 TeV muon energy measurement is achieved

Low-energy neutrino selection method based on boosted decision tree complimentary to cut-based analysis (talk by Dmitry Zaborov) is developed

106 neutrino candidates are selected in 326 days single-cluster livetime data April-June 2019 data, 81.2 expected from atm. neutrino MC

Improvement of neutrino detection efficiency by the factor ~2 is demonstrated wrt. low-energy reconstruction algorithm

An effort to extend muon analysis to multi-cluster data and larger time span is ongoing