

Optical activity in lake Baikal: GVD results



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Outline:

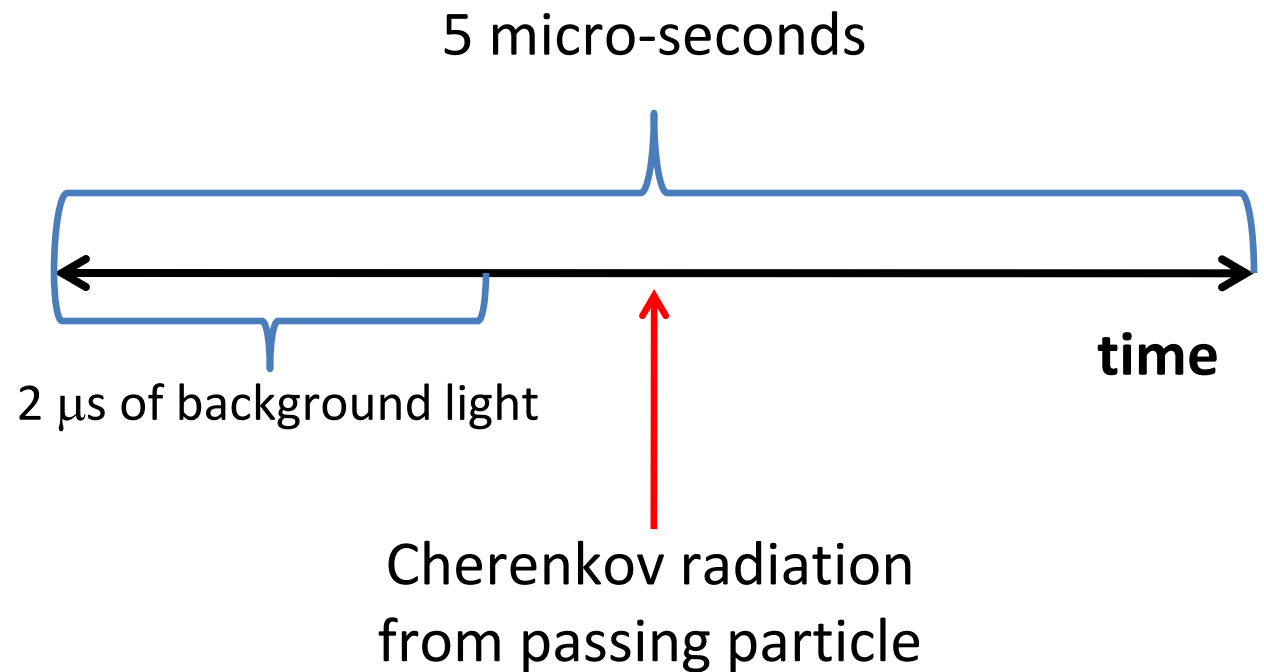
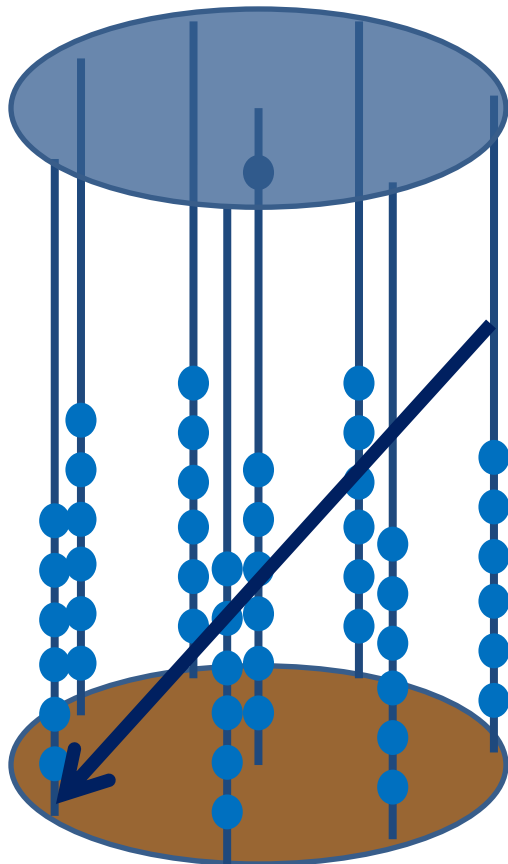
- Input data
- General overview
- Torrent flows
- Sinking layer

Outline:

- Input data

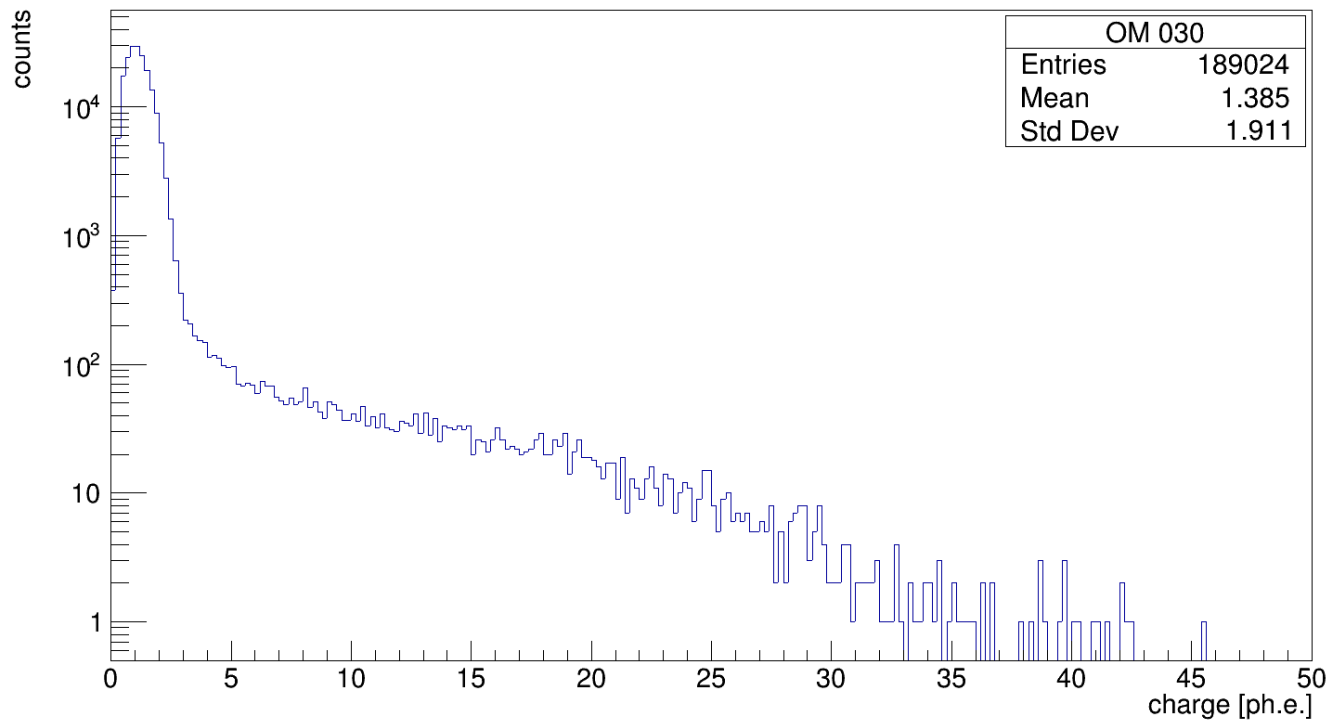
Input data

The 3D array of photo-sensors registers Cherenkov light & background



Input data

The charge distribution of the background light given in units of photo-electrons:

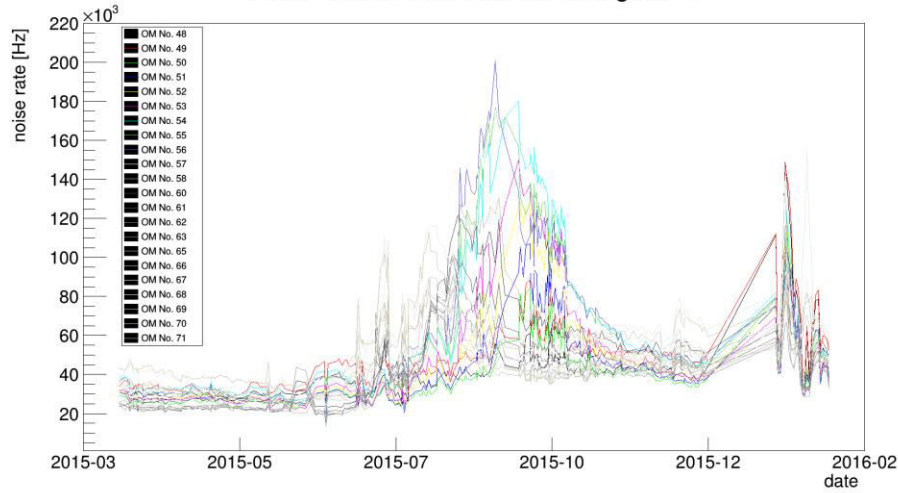


Outline:

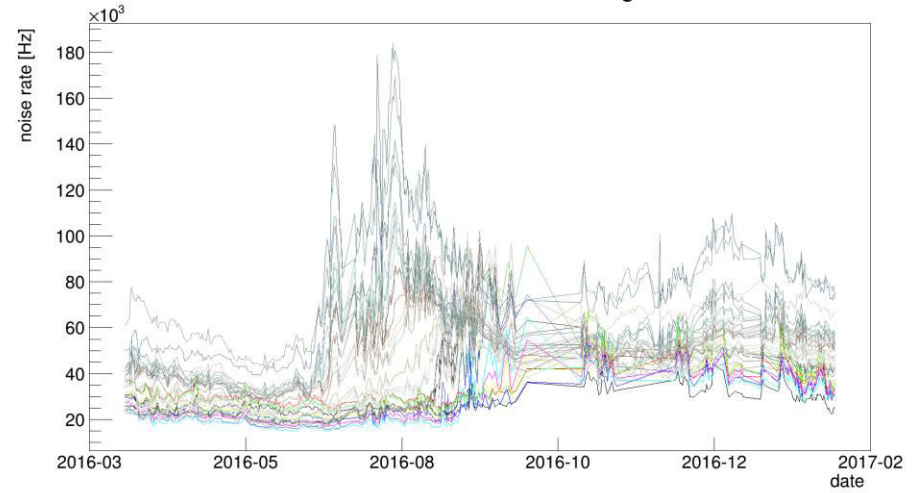
- Input data
- General overview

Overview: years 2015-2018

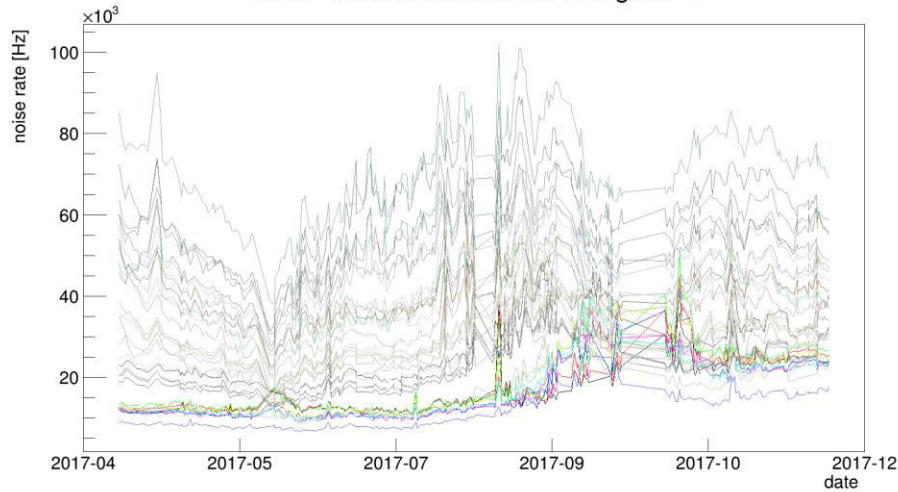
Noise rates versus time for string No. 3



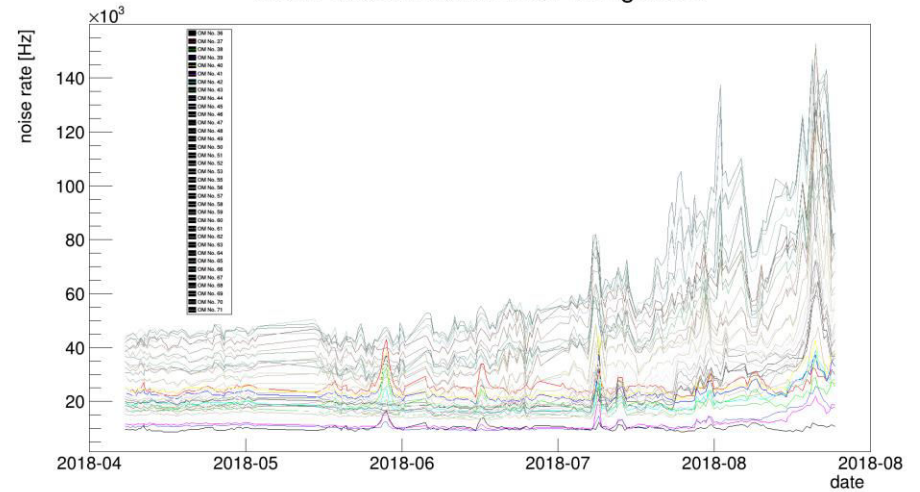
Noise rates versus time for string No. 4



Noise rates versus time for string No. 3



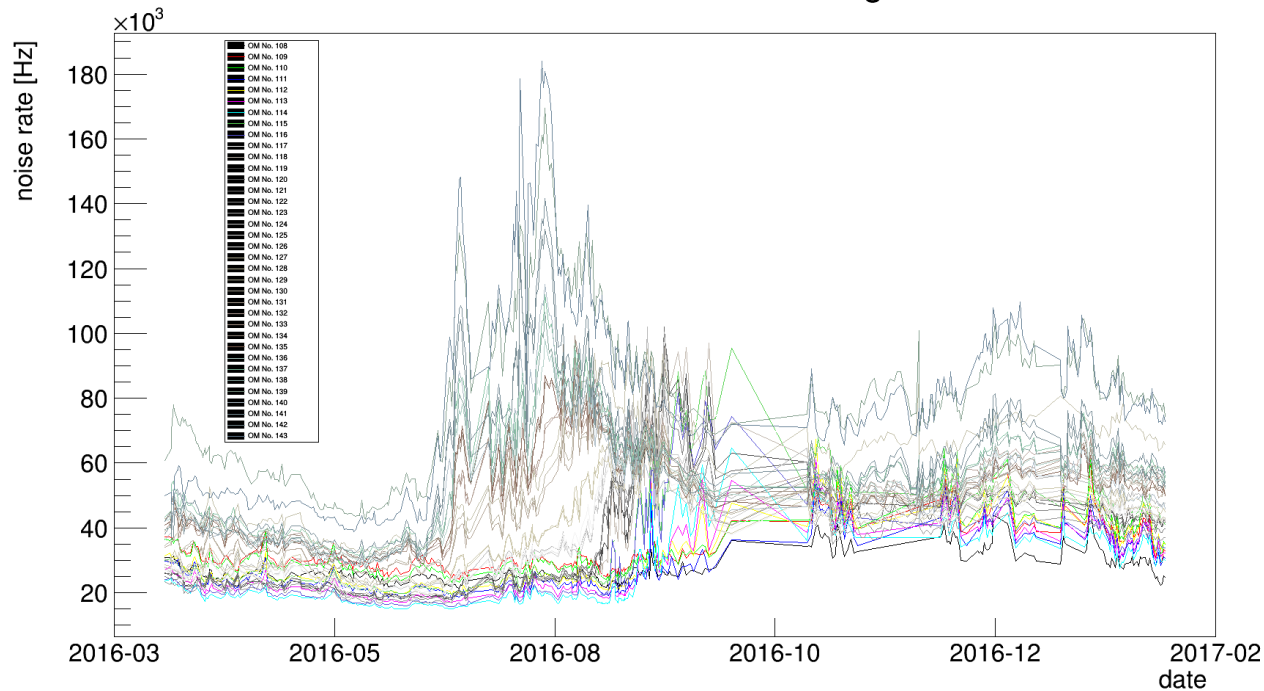
Noise rates versus time for string No. 2



Water properties

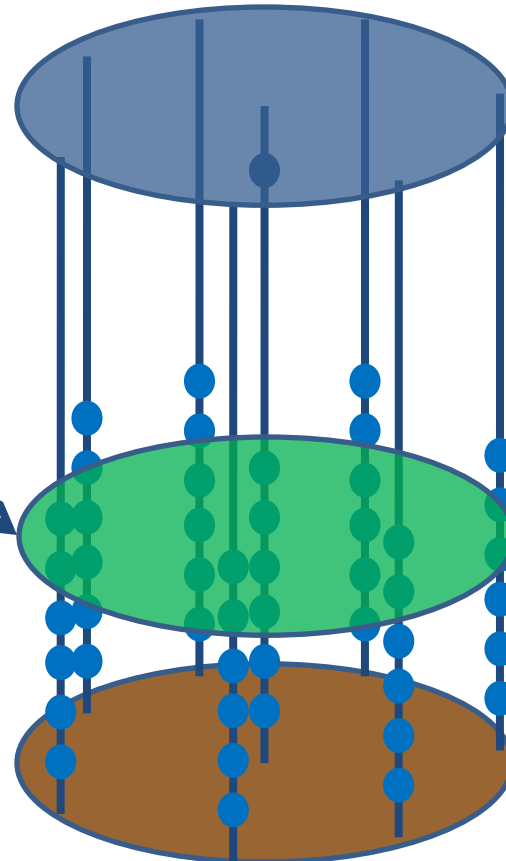
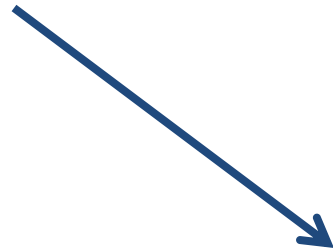
- **Moderately low background in fresh water:**
20 – 60 kHz (R7081HQE) absence of high luminosity bursts from biology and K^{40} background.

Noise rates versus time for string No. 4



Water properties

layer – optical modules
at the same depth

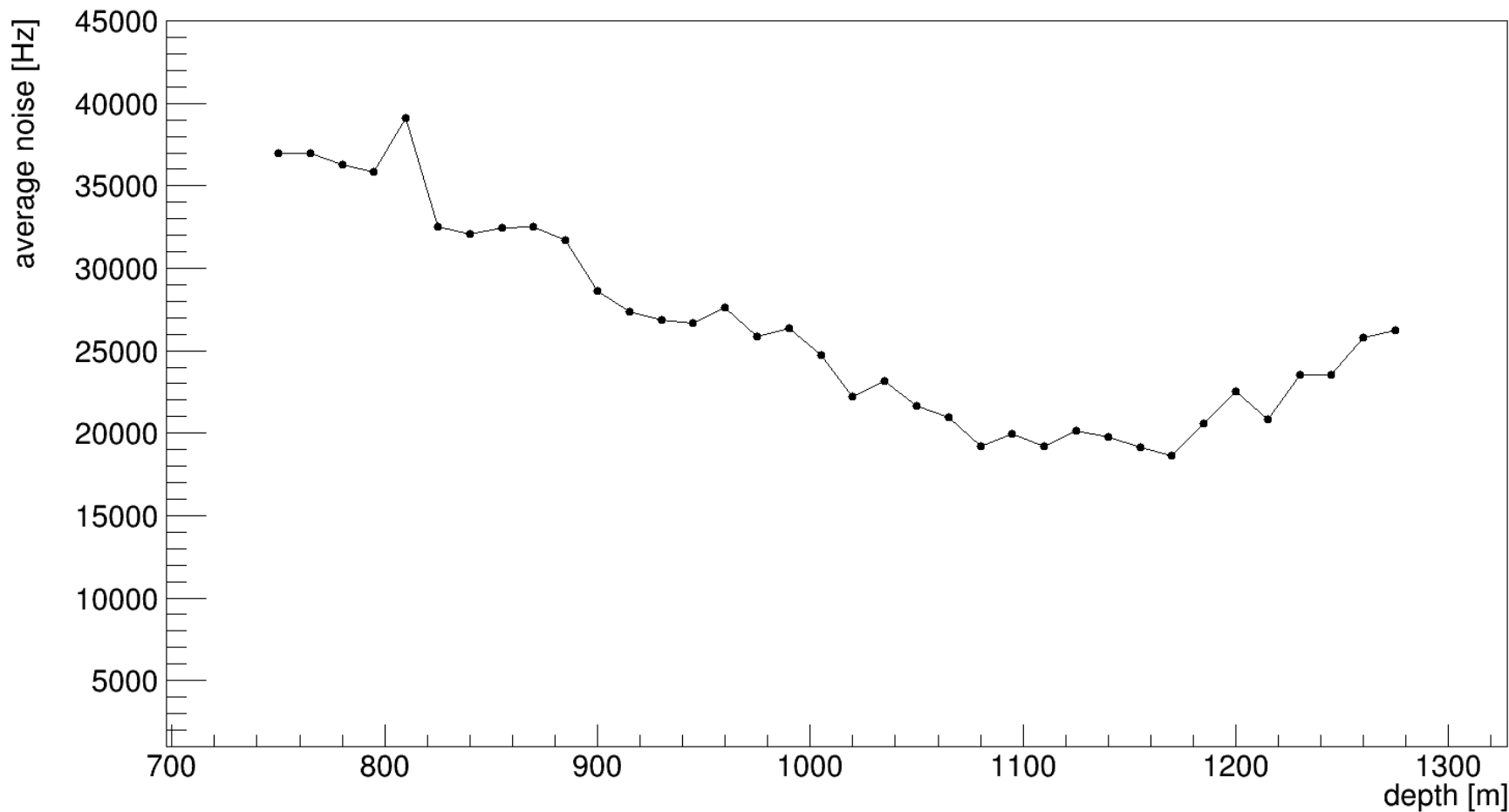


layer 36 – top

layer 1 – bottom

Water properties

Noise rates versus depth

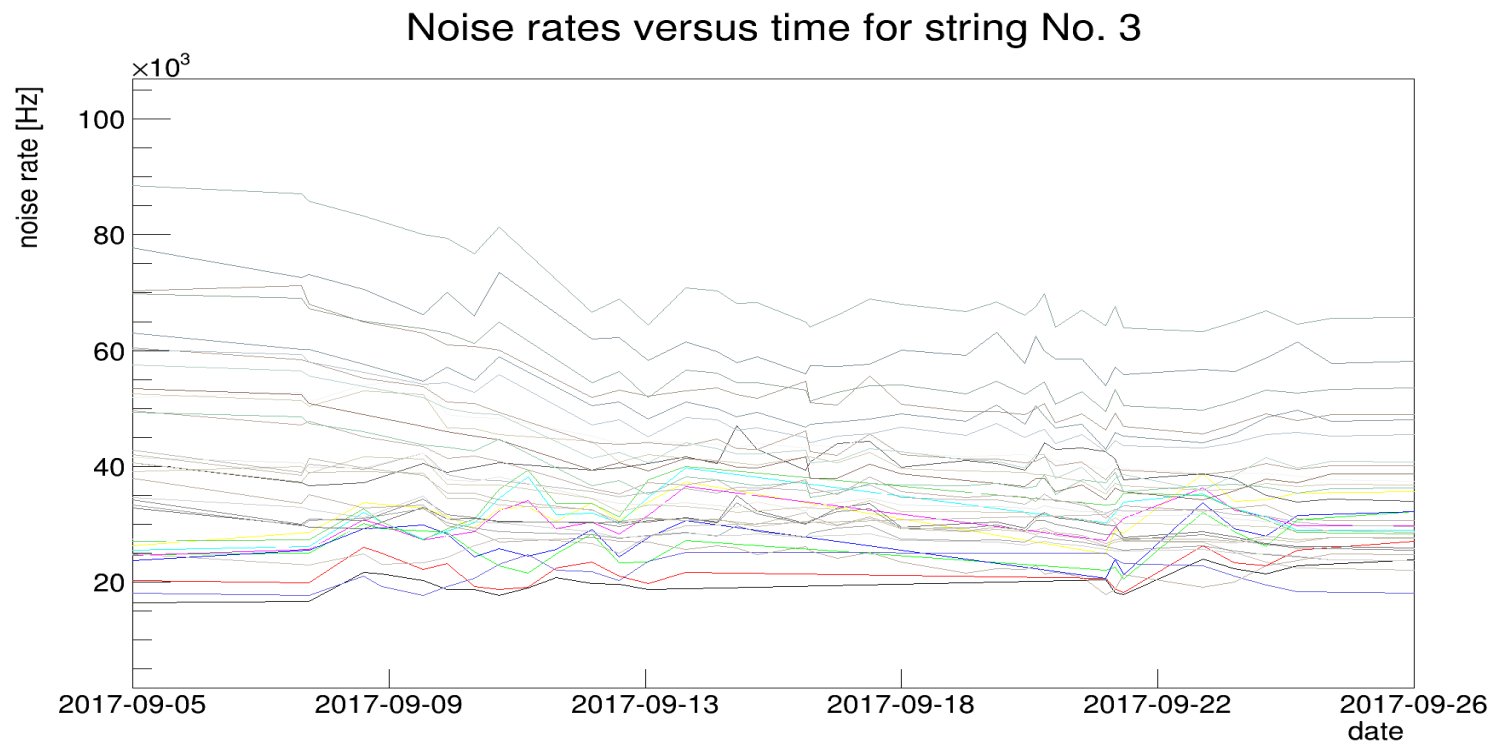
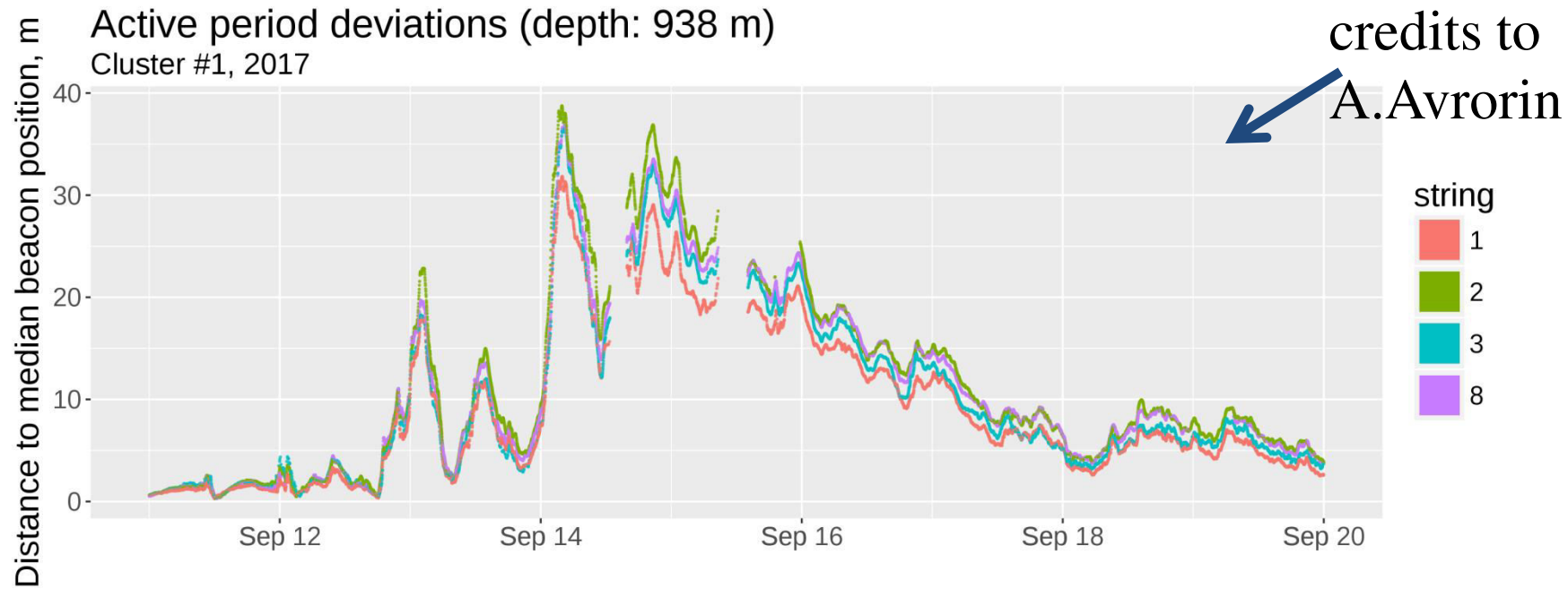


Outline:

- Input data
- General overview
- Torrent flows

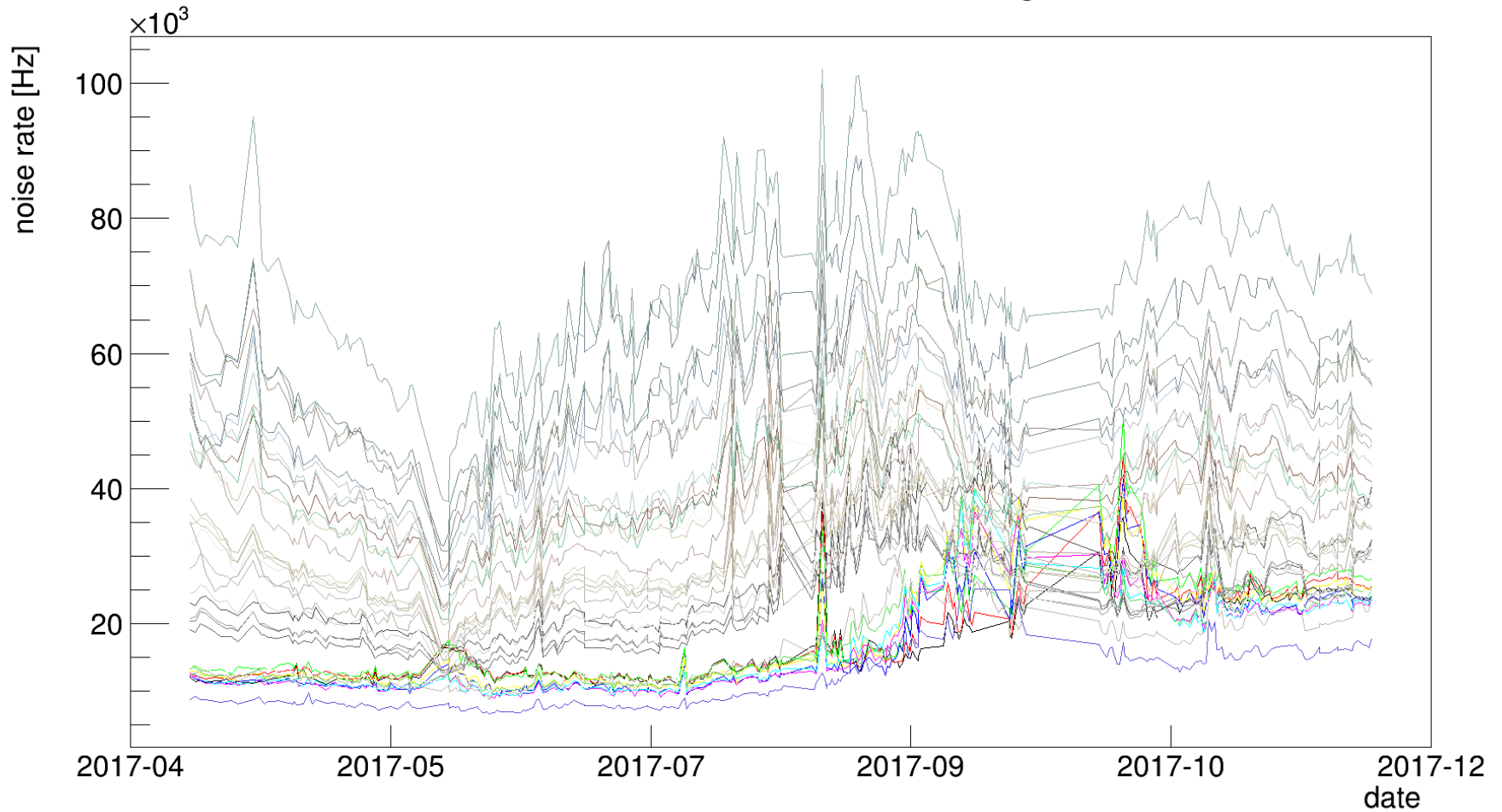
Torrent flows in lake Baikal

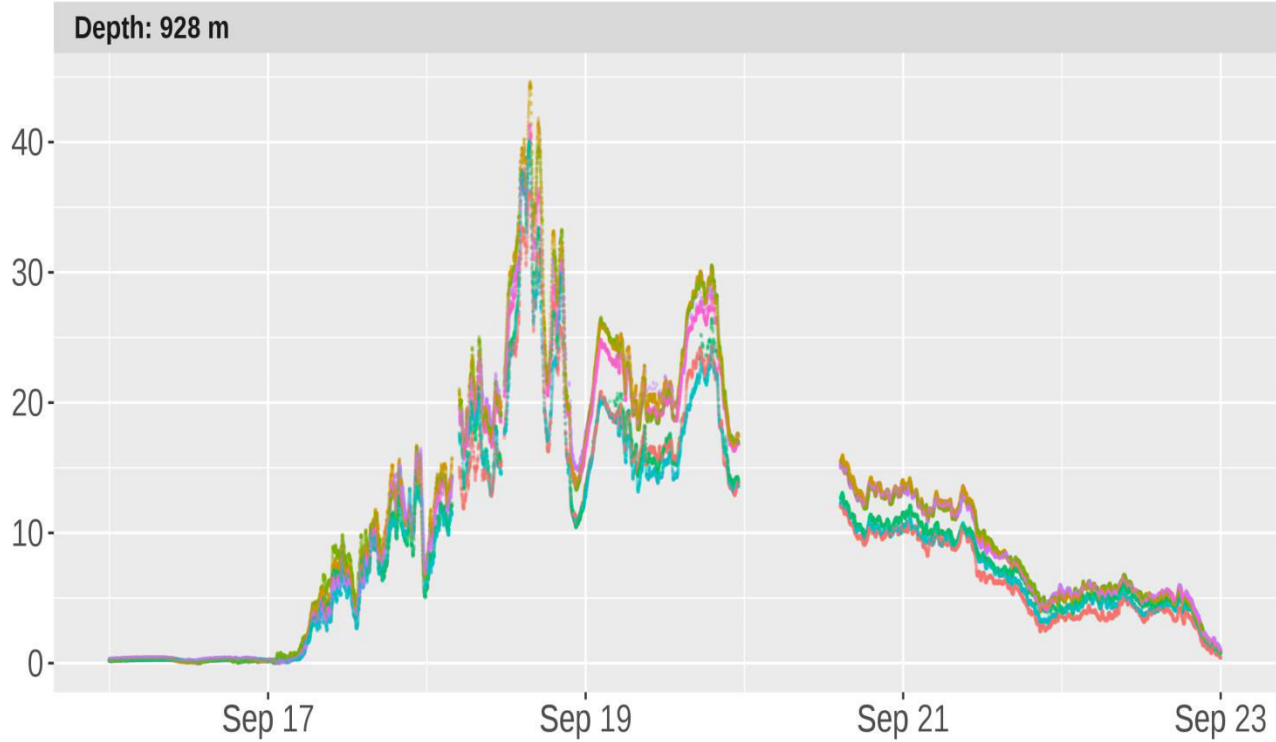
- We searched for a correlation between optical noise activity and torrent flows in the lake Baikal
- The idea is to find out whether some bioluminescence might influence our background



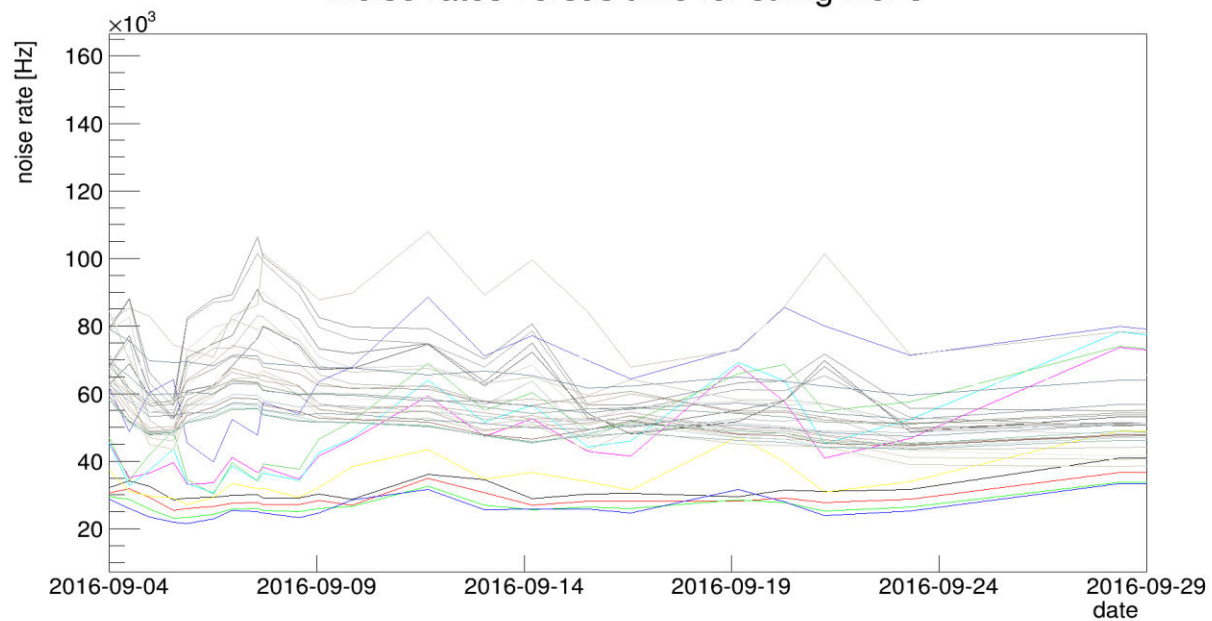
Year 2017

Noise rates versus time for string No. 3



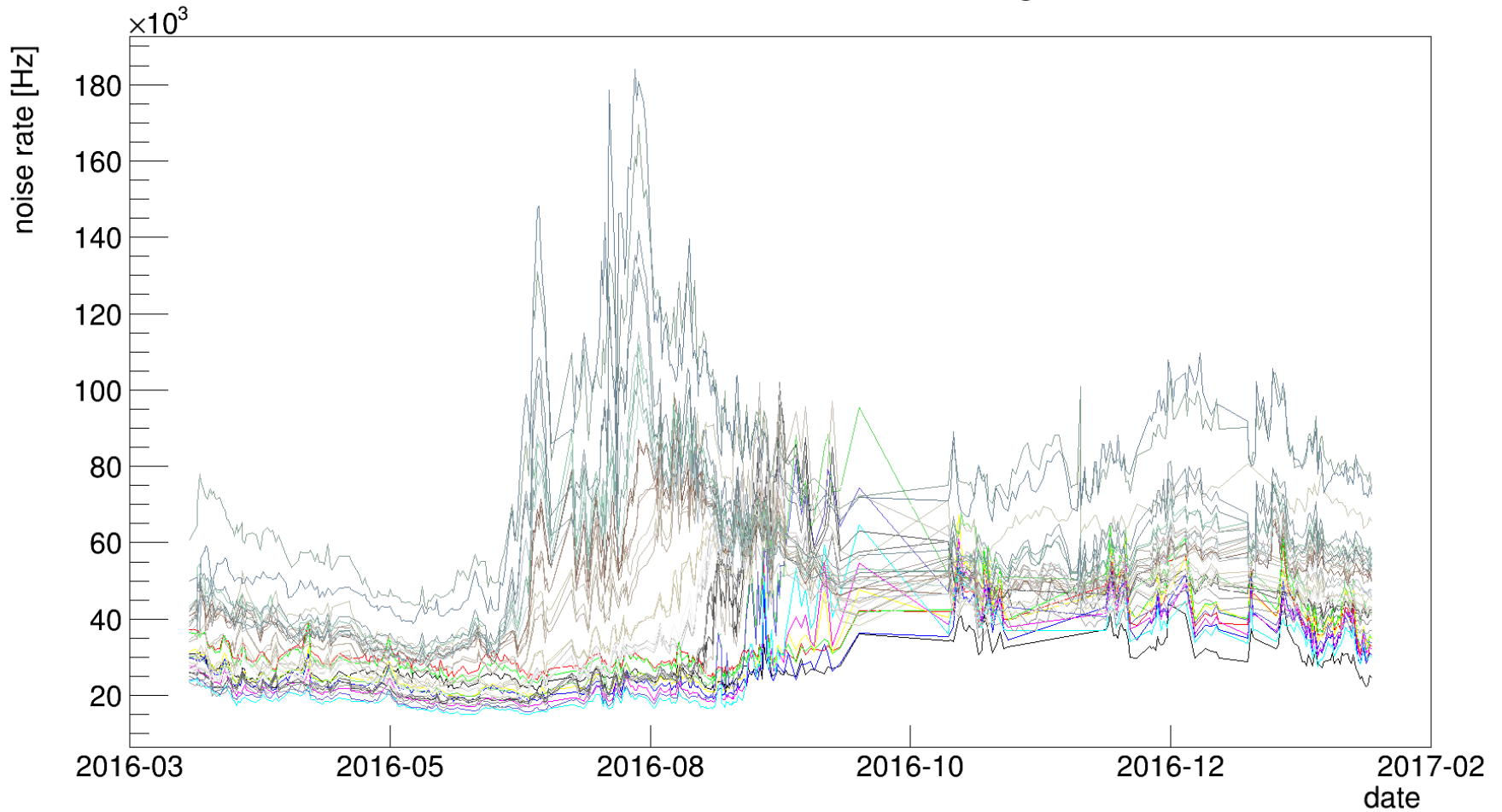


Noise rates versus time for string No. 5



Year 2016

Noise rates versus time for string No. 4



Torrent flows in lake Baikal

In conclusion, we do not see correlation between the optical noise and torrent flows in lake Baikal

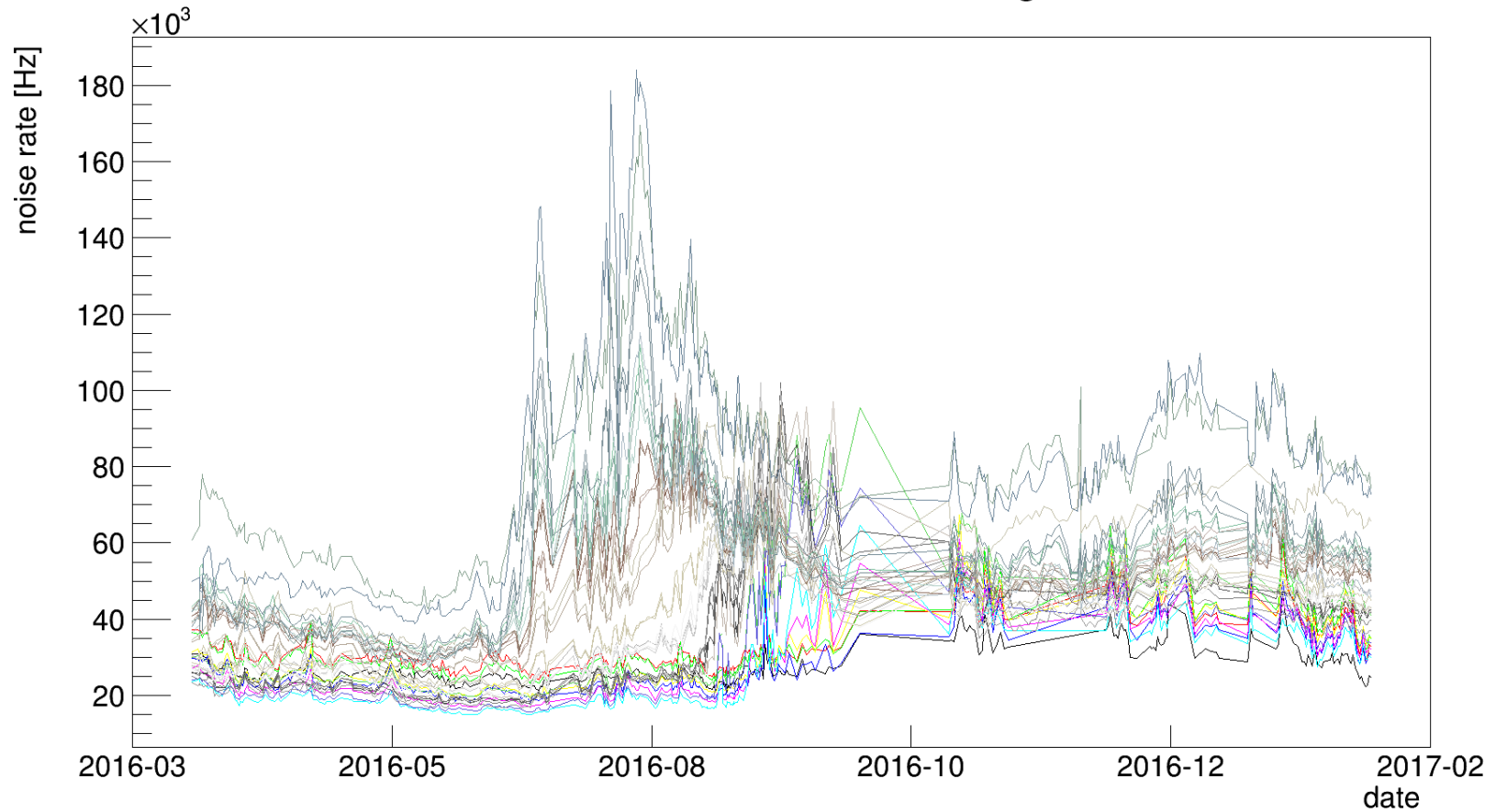
Outline:

- Input data
- General overview
- Torrent flows
- Sinking layer

Sinking layer

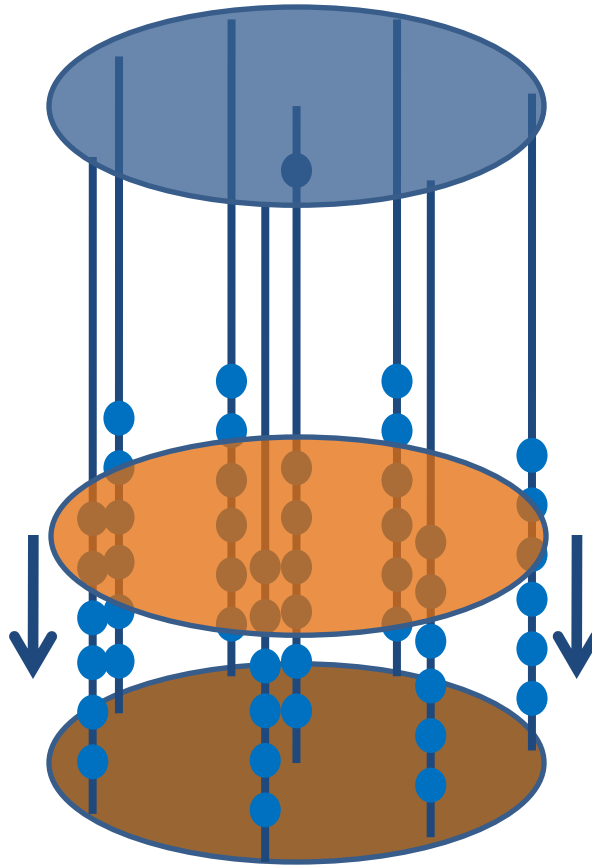
The noise versus time for the year 2016:

Noise rates versus time for string No. 4



Sinking layer

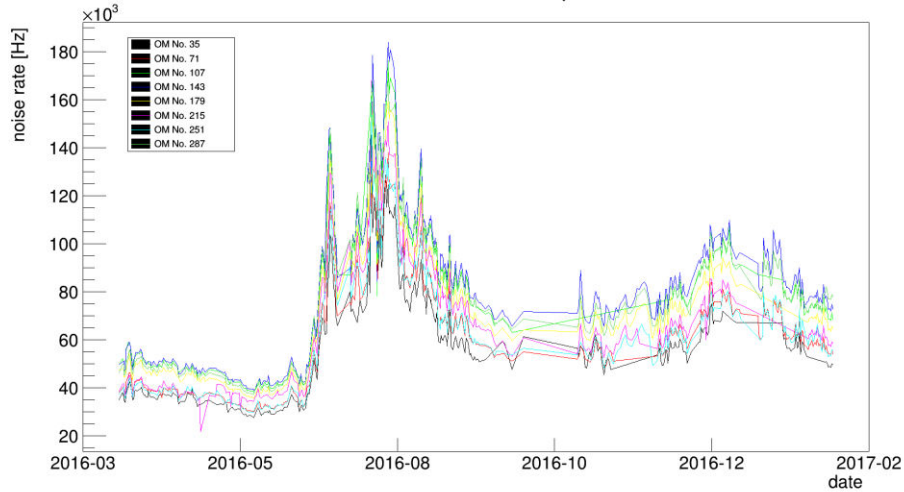
We might see an optically high active layer that flows through our detector within the year



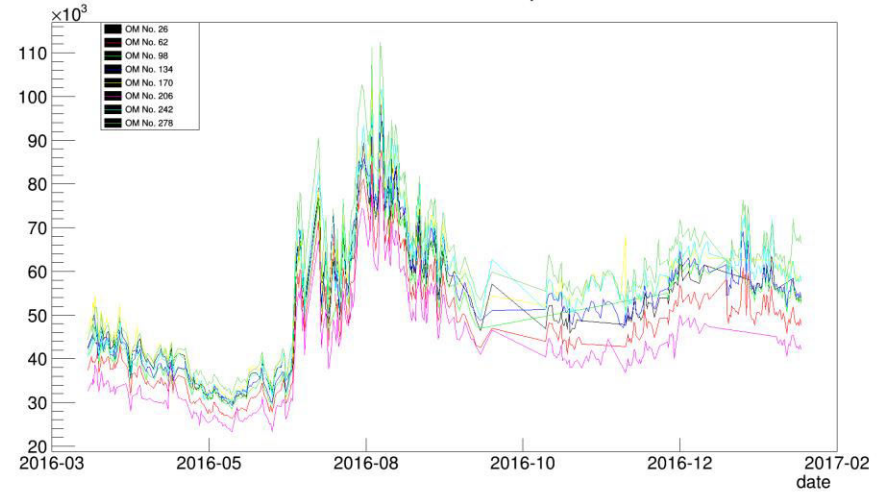
Sinking layer

The noise versus time for various layers exploits the observed effect

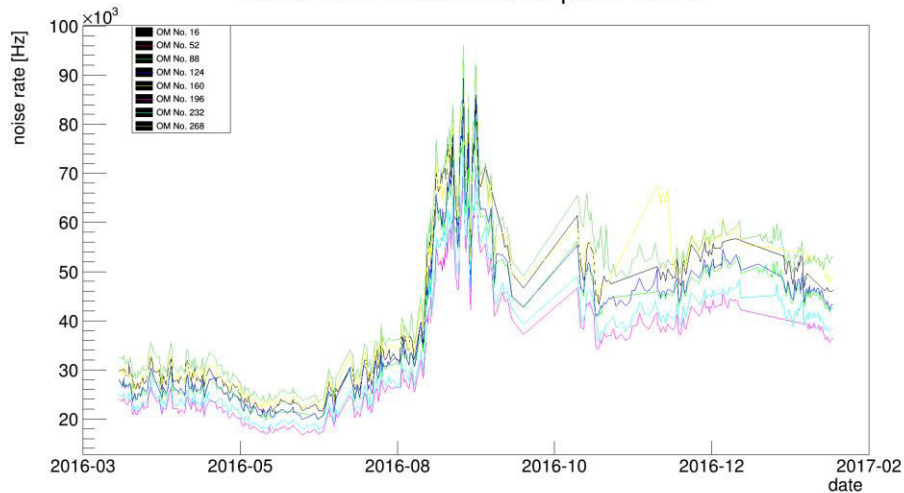
Noise rates versus time for plane No. 36



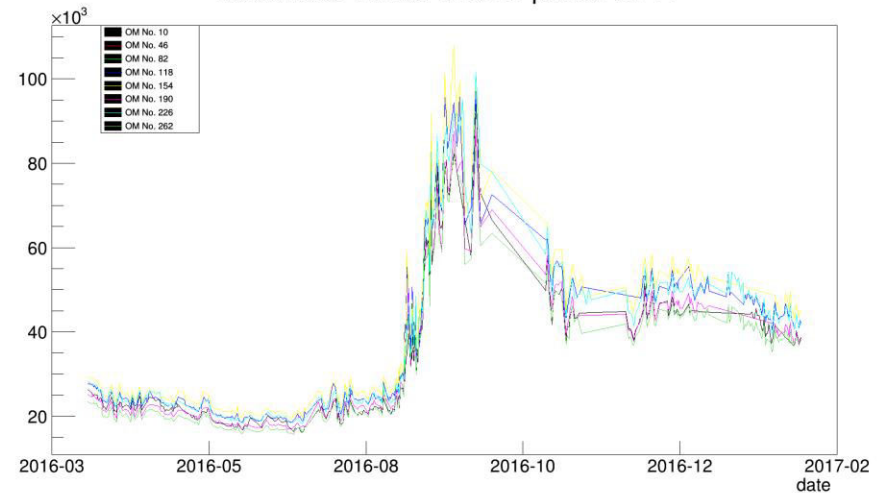
Noise rates versus time for plane No. 27



Noise rates versus time for plane No. 17



Noise rates versus time for plane No. 11



Sinking layer

The sinking layer speed estimate:

date	velocity [meters /day]
08/03/16	44.91
08/11/16	6.43
08/25/16	6.00
09/06/16	11.25
09/15/16	8.33
10/28/16	1.36

Thank You for your attention

