1 Institute of Geography RAS
2 IGE Institut des géosciences de l'environnement

# Continuous (CFA) $CH_4$ record of the Elbrus ice core, Caucasus (preliminary results)

*Diana Vladimirova (1), Xavier Faïn (2), Patrick Ginot (2), Stanislav Kutuzov (1), Vladimir Mikhalenko (1)*
dv@igras.ru

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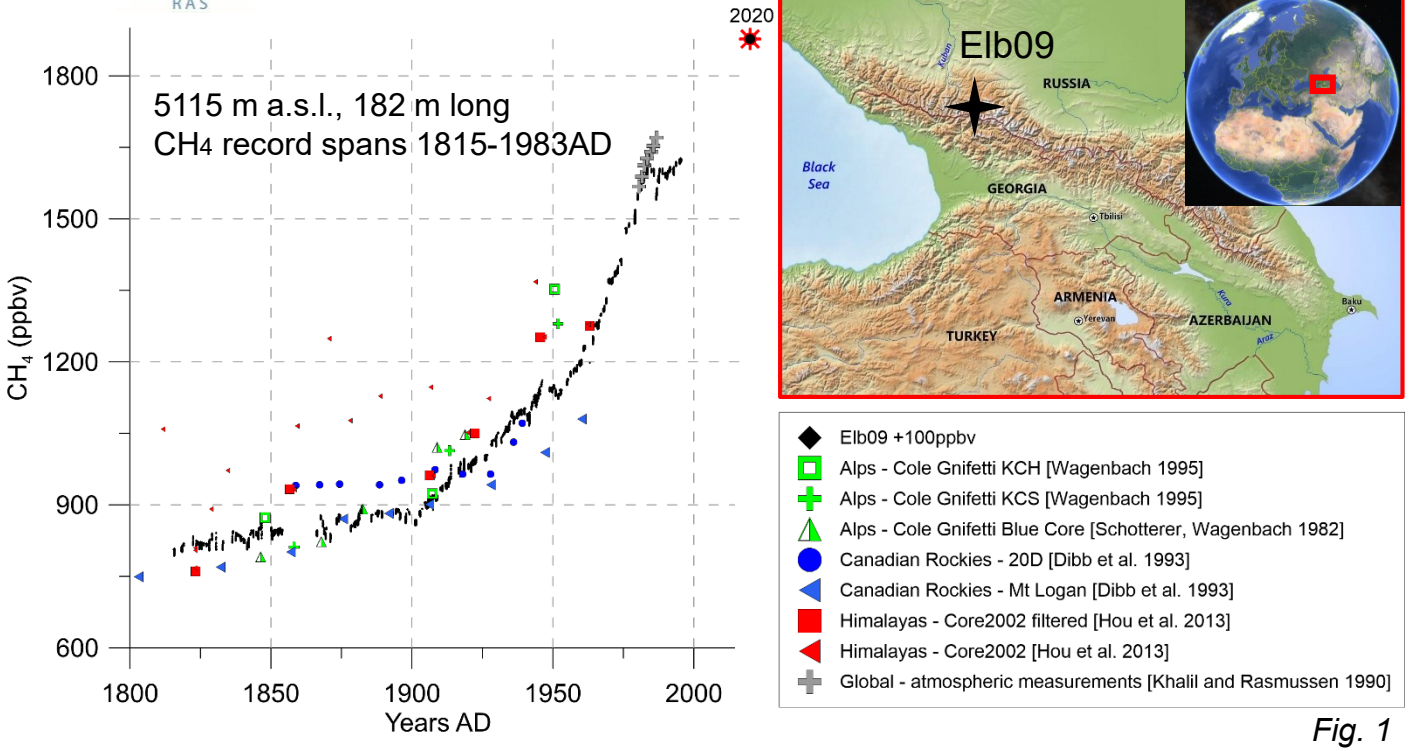









*Fig. 1*

## Wavelet coherence of CFA $CH_4$ and CFA dust

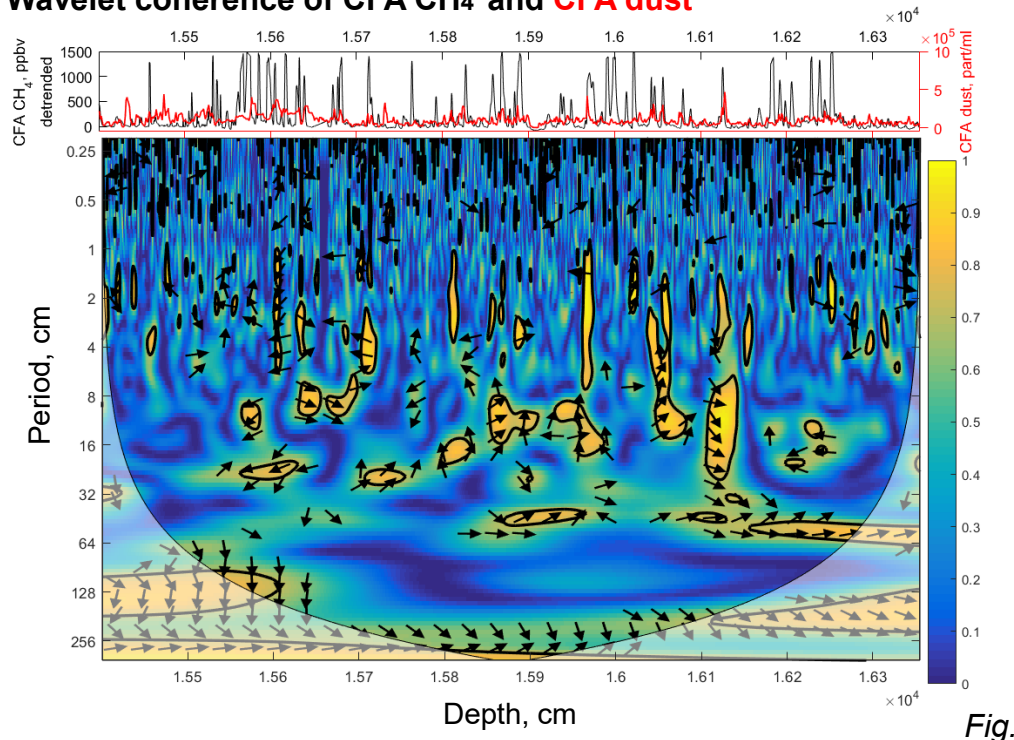



*Fig. 2*

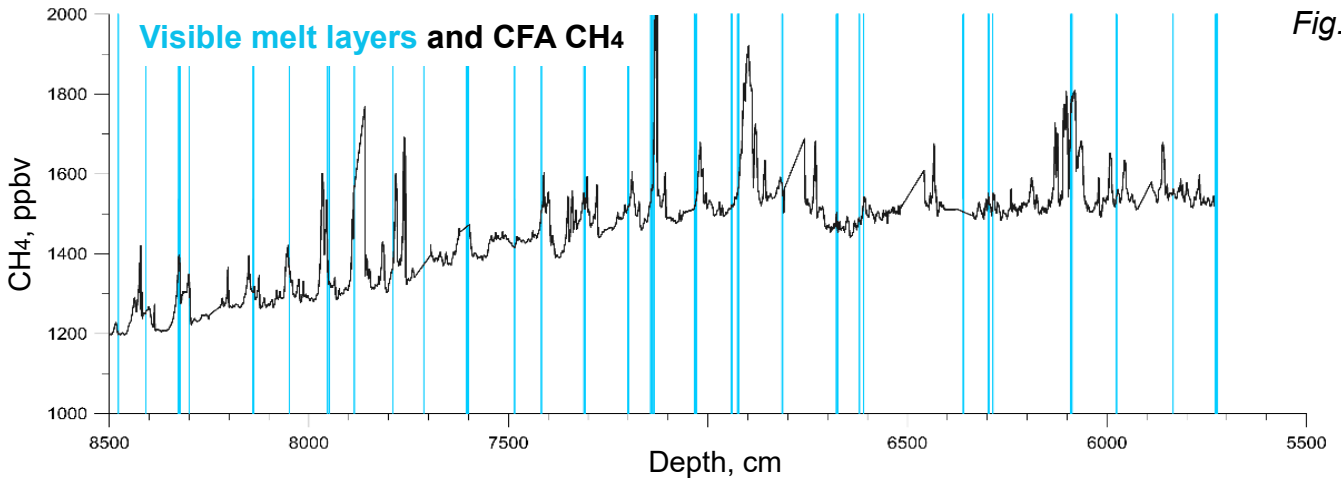
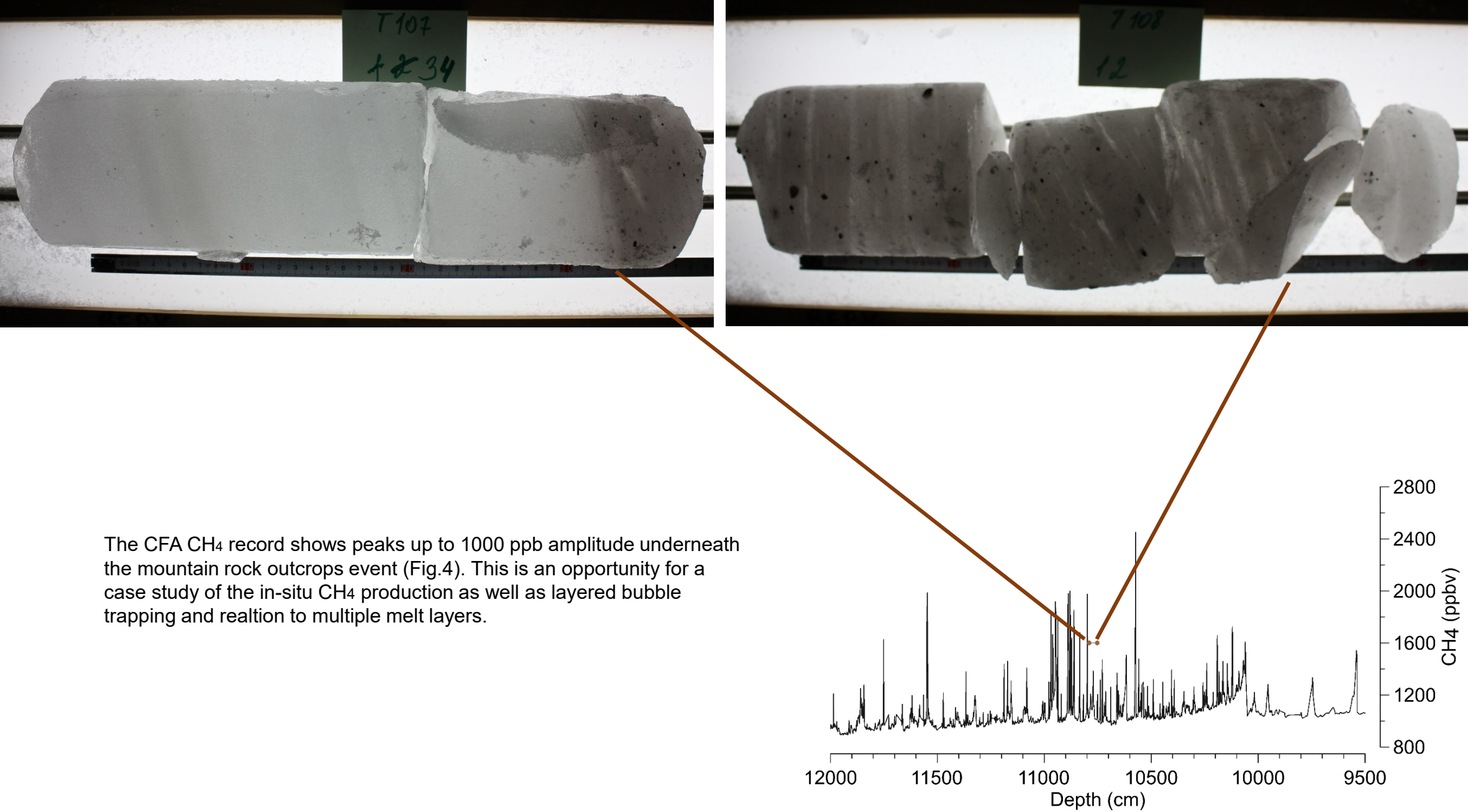



*Fig. 3*

First high-resolution mid-latitude $CH_4$ record (Fig. 1). It aims to better constrain the past evolution of mid-latitude methane sources.
The lower part (100-163 m) depicts a coherence of short-scale (1-30 cm) baseline variability with the dust record (Fig. 2). It might be a key to formation of dust-related elevated $CH_4$ found by Lee et al. 2020.
The upper part (to 85 m, up to a density 0.895±0.014 g $cm^{-3}$) reflects a common $CH_4$ variability (~150-250 ppbv) coherent with visible melt layers (Fig. 3), which provides an opportunity for reconstructing the melt layers in the lower part (where the melt layers are invisible).

Wavelet coherence – script credits by Grinsted et al. 2004




The CFA $CH_4$ record shows peaks up to 1000 ppb amplitude underneath the mountain rock outcrops event (Fig.4). This is an opportunity for a case study of the in-situ $CH_4$ production as well as layered bubble trapping and realtion to multiple melt layers.

*Fig. 4*