

Paweł WANDY CZ¹, Eryk ŚWIĘCH¹, Leo EISNER³, Andrzej PASTERNA CKI¹, Rafał MATUŁA², Tomasz MAĆKOWSKI¹, Joanna LEWANDOWSKA-ŚMIERZCHALSKA²

¹Department of Fossil Fuels, Faculty of Geology, Geophysics and Environment Protection at the AGH University of Science and Technology

²AGH University of Science and Technology, Drilling, Oil and Gas Faculty

³Seismik s.r.o., Czech Republic

Attenuation in Polish shale gas deposits

Abstract

Microseismic monitoring is usually mapping hydraulic fracture through locations of microseismic events. However, the microseismicity also provides additional information on medium properties as the seismic waves travel through the reservoir. This information can be used to assess the reservoir, improve microseismic locations or design optimal microseismic monitoring. In this study we apply the peak frequency method to a microseismic dataset that was recorded during the first microseismically monitored hydraulic fracture of the Polish shale gas deposits in the Lubocino 2H well, northern Poland. Microseismic monitoring was performed using an array of 11 3C downhole receivers deployed in a nearly vertical monitoring borehole. To determine the attenuation we used 4 out of 6 stages of fracturing which induced more than 500 located events. For the measurements of attenuation we choose 10 events with good SNR from the Stages 1, 2, 4 and 5. Event locations ranged from approximately 300 m (Stage 5) to approximately 650 m (Stage 1) distance from the nearest receiver.