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## **2D shallow seismic study of terrigenous heavy oil reservoir driven by SAGD at the Ashalchy Oil Field, Tatarstan**

Stepanov A., Sitdikov R., Golovtsov A.

*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

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### **Abstract**

The objective of seismic experiments was to estimate possibilities of shallow seismic in control of SAGD recovery process under geological conditions of the South Tatar arch. Bituminous sandstone member Ufimian time (P2ss) is the productive formation of Ashalchy heavy oil field. Seismic acquisition, data processing and results obtained at north-west dome heavy oil field are presented in this paper. Thermal field established in reservoir driven by SAGD has complicated distribution. It was found that steam chambers were mapped by low values of interval velocity and bright spot dynamic anomalies. Distribution of anomalies along seismic profiles let make an assumption that size and temperature of steam chamber are controlled by effective porosity of surrounding formation and integrity overlying seal. Dense rocks are observed around high temperature chamber. Dynamic anomalies are conditioned by hydrocarbon gas and hydrogen disulfide let out from heated heavy oil. Gas products accumulate at the reservoir top and also above low temperature chambers forming gas cap. The results obtained allow to recommend shallow seismic for monitoring steam chamber's dimensions in terrigenous reservoir within Cheremshan-Barstrick group of heavy oil fields.

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### **Keywords**

Bright spot anomaly, Digital signal processing, Heavy oil, Interval velocity, Shallow seismic, Steam chamber