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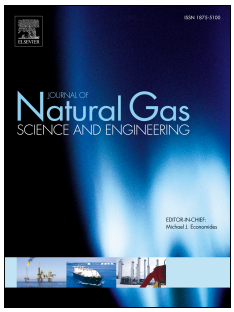

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Permeability enhancement of coal by chemical-free fracturing using high-voltage electrohydraulic discharge

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Highlights

- A novel stimulation technique, namely high-voltage electrohydraulic discharge (EHD) has been developed and validated for coal cracking.
- Electrohydraulic discharge shows a great potential to create additional flow paths and permeability in coal.
- Shockwaves generated by EHD increase the accessible porosity of the coal, predominantly in the meso- and micropore size range.
- The banding in coal has a significant influence on breakage and fractures are more likely to occur in weak plies rather than in the soft dull coal.

Abstract

Fractures, cleats or cracks provide the main fluid pathways for methane extraction from Coalbed Methane (CBM) gas reservoirs. For deep coal seams, where the cleats are often closed by the high overburden pressure, or some shallower but tight coals, fracturing operations to form new pathways or clean out existing but blocked natural cracks are necessary, for CBM wells to produce commercially attractive gas rates. This is usually done