Exogenous initiation of sudden methane emissions in mines

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Modern ideas about the methane content in coal seams are based on the fact that methane is in coal in a free, adsorbed, absorbed form. Coal has a well-developed fractured and pore systems. It is assumed that fracturs contain free methane and methane adsorbed on the surface of pores. It is believed that most of the methane is introduced into the intermolecular space of a coal block (solid solution). Such a distribution of methane in coal occurred as a result of metamorphism, and with the combined effect of gas pressure and tectonic stresses.

There are suggestions that sudden outbursts could have been initiated by the Moon. In order to substantiate the influence of the Moon on emissions in mines, they give a reason on the synchronicity of explosions in mines located at a considerable distance from each other. Analysis has shown that it is not the Moon, but powerful meridional atmospheric processes that initiate sudden methane emissions in the mines.

Spatial changes of the opposite atmospheric vortices cause stress on the Earth's surface and lead to the deflection of the Earth's crust. Under the influence of an anticyclonic crust deflection, an increase in a lithostatic pressure on coal seams occurs. At the same time, in the vicinity of the mine, fractures containing free methane are compressed (closed). The rapid drop in an atmospheric pressure (cyclonic field) "reveals" the moving masses of methane and ensures the rapid movement of methane mass through fractures to wider fractures - into the mine shafts. The abrupt release of a dangerous amount of methane into the mine, in which "the measuring equipment showed the absence of a life-threatening volume of methane before a catastrophe", is caused by an increase in the horizontal pressure gradient of methane into the mine from the neighboring coal seams.