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# Numerical simulations of deep geothermal groundwater flow in the Seferihisar-Balçova Geothermal system, Turkey.

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The worldwide concern about the consequences of global warming is increasing interest in developing geothermal resources, both for power generation and direct use. This is providing new field data numerical investigations of extensional geothermal systems. The numerical models should explore the role of faults and fractures on the different forces driving hot fluid flows. To date, however, there has been limited effort made to systematically determine the basic relationships between system configuration (e.g., hydraulic permeability, inherited geological structures) and the resulting thermally induced flow behavior of geothermal systems.
An exceptional example to investigate the mentioned issues is the hot Seferihisar-Balçova Geothermal system (SBG) which is part of the Cesme Peninsula, Western Anatolia, Turkey. In the SBG, geothermal processes are extremely vigorous and hot waters close to boiling temperature can be observed at the surface.
Here, the first numerical models of coupled fluid flow and heat transport based on the SBG are presented. The final objective is to understand the basic processes driving the thermal waters within the SBG, the role of different driving forces as well as their interactions with faults in controlling geothermal processes.
The results will shed new light on the links between the migration of subsurface energy, active transport processes and tectonic structures.