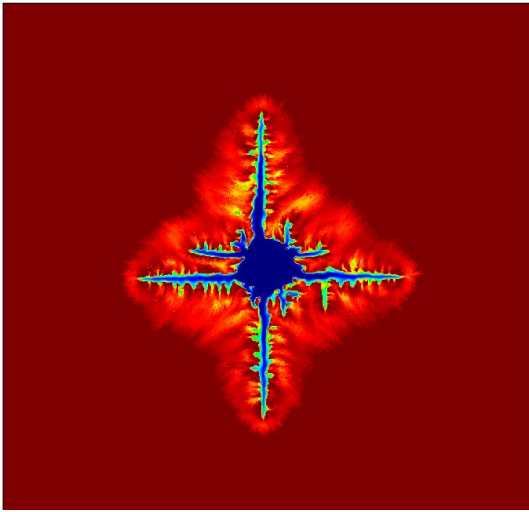


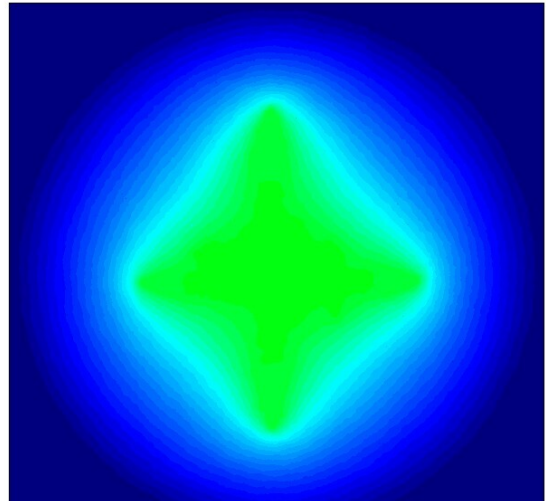
The chair of Petroleum and Geothermal Energy Recovery seeks for a master student to write a thesis on the topic of:

“Numerical modeling of wormhole”

including a research internship at Waseda University (Tokyo).



(a) Numerical simulation of wormhole



(b) Simulated pressure profile

Research descriptions

As acidic fluids flow and dissolve minerals in carbonate formations, the reaction may localize into a dendritic pattern known as wormhole, which dominates flow paths in carbonate formations. In the petroleum industry, wormholes are deliberately induced through acid injection to improve well productivity in carbonate reservoirs. Wormholes can also form during the injection of CO₂ into carbonate formations. However, such localized dissolution poses challenges for geological CO₂ storage because channelized flow can leave significant portions of the pore space unused.

In this project, we numerically simulate wormhole formation and growth using an in-house code and compare results against experiments. We are looking for a candidate who is familiar with numerical methods, scientific programming, and solving PDE. A successful candidate is expected to work in collaboration with our partners in Japan. And part of the work will be conducted at our partner, Waseda University in Tokyo as a visiting research intern.

If interested, please contact Prof. Dr. Keita Yoshioka at keita.yoshioka@unileoben.ac.at.