Curtin University

Juan Felipe Giraldo Avila

Research Area: Space Science and Technology Centre

Brief Summary

The geological mechanisms that allow mineralising fluids to flow from depth and form localized mineral deposits like orogenic gold systems remains uncertain and a matter of debate. The traditional assumptions of fluids travelling through highly permeable faults require these faults at depths below the brittle-ductile transition. An alternative model based on a multi-physic oscillator explains how impermeable shear zones in such environments, under specific conditions where temperature sensitive endothermal reactions trigger in-situ release of fluids that lubricate the faults and lead to fault reactivation. The response of such systems varies depending on the stress regime and ambient conditions, including slow creep, one-off reactivations events, or episodic reactivations events during which the permeability increases by several orders of magnitudes and allows fluids from depth to flow upwards. The latter process is called fault-valve mechanism.

Education: MSc and BSc at Universidad Nacional de Colombia

Research interests: Geological modelling, material instabilities, computational mechanics.

Thesis title: Computational modelling of the fault-valve behaviour of chemical shear faults

Supervisors: Prof. Victor Calo, Prof. Ian Davies, Dr Thomas Poulet.

Links: https://co.linkedin.com/in/juan-felipe-giraldo-avila-86656a89