

pide: a python-based petrophysical interpretation tool of electrical conductivities of materials from crust to mantle transition zone.

S. Özaydin^{1,*}, L. Li², U. Singh¹, P. F. Rey¹, M.C. Manassero³

¹School of Geosciences, University of Sydney, Sydney, Australia.

²School of Earth Sciences, University of Western Australia, Perth, Australia.

³School of Natural Sciences (Physics), University of Tasmania, Hobart, Australia.

*contact: sinan.ozaydin@sydney.edu.au

SUMMARY

pide is a python library (<https://github.com/sinanozaydin/pide>) designed to compute geophysical parameters, such as electrical conductivity and seismic velocity, based on data from experimental petrology, mineral/rock physics, and thermomechanical modeling studies. It can determine the theoretical electrical conductivity of any earth material referenced in the literature, as well as seismic velocity using the external 'sister' library SAnTex. These theoretical calculations enable users to employ inversion modules to interpret geophysical anomalies compositionally or to convert thermomechanical models into geophysical observables. With spatial mappings of earth materials, preferably loaded from a thermomechanical model, pide can create synthetic models for electrical conductivity and seismic velocity, and generate gravity and magnetic anomalies.

Keywords: magnetotellurics, python library, thermomechanical modelling, petrophysics

ACKNOWLEDGMENTS

This study is supported by the Australian Research Council (ARC) Linkage Grant ARC-LP190100146 and ARC DP Grant ARC-DP220100709.