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Radiogenic Heating and the Thermal Evolution of Earth-like Exoplanets[1] ALYSA ROGERS, Brandeis University, JISHENG ZHANG, LESLIE ROGERS, University of Chicago — Radiogenic heating is an important component of the thermal evolution and geodynamo of a planet; thorium and uranium alone account for 30-50% of the Earth's internal heat budget. Most previous models of rocky planet interiors have used chondritic values for radiogenic heating, which doesn't take into account variance in abundance due to planet formation, partitioning of radioactive elements into the core, or variation of host star photospheric abundances. This project explores the effects that different radioactive abundances in the mantle have on the thermal evolution of a planet by expanding a previous model of rocky planets. We found that the upper bound of radioactive abundances significantly prolonged the solidification time of the core, explained by greater flux as compared to the lower bound. Modelling the effects that variations in radioactive element abundances have on rocky planets' thermal evolution could allow us to estimate planet compositions from observations of planetary magnetic fields.

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