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Using Potassium-40 to Study the Radiogenic Heating of Exoplanets LAUREN ULBRICH, Central Michigan Univ — The radioactive decay of isotopes is an integral part of the heating of a planet's mantle, and is connected to continent formation and tectonic plate activity, which planetary scientists consider necessary for a habitable environment. One of the key isotopes that is known to drive radiogenic heating on Earth is ^{40}K. Recently, our group constrained experimentally for the first time the destruction rate of ^{40}K through the measurement of the ^{40}Ar(p,n)^{40}K reaction rate at Ohio University. A new experiment to further constrain the destruction rate of ^{40}K by studying the ^{37}Cl(α,n)^{40}K reaction is being planned to reduce nuclear physics uncertainties in the production of ^{40}K. In preparation, we performed post-processing reaction network calculations to estimate the sensitivity of ^{40}K production to the relevant reaction rates. From our final results, we expect to inform studies of radiogenic heating in exoplanets.

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