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Automated stellar variability classification using TESS light curves[1] EMMA CHICKLES, Wellesley Coll, TANSU DAYLAN, MIT Kavli Institute, LINDSEY GORDON, Wellesley Coll — Stellar variability has classically been divided into extrinsic sources (such as eclipses and rotation) and intrinsic sources (such as flares and pulsations). We conduct a census of different types of stellar variability using 2-minute cadence photometric light curves observed in the two-year mission of the Transiting Exoplanet Survey Satellite (TESS). We use an unsupervised artificial neural network and feature engineering to generate compressed, low-dimensional representations of the data. We apply clustering algorithms to the learned representations to perform large scale classification of stellar variability in TESS light curves. We validate our pipeline using the General Catalogue of Variable Stars, which contains 54,821 stars primarily in the Milky Way galaxy. The large scale survey produced by TESS offers an opportunity to calculate statistical descriptions of properties, such as type, age, metallicity, and mass, of different variability types. Our homogeneous census of stellar variability will lead to a better understanding of the underlying demographics.

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