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A Validation Tool for TESS Exoplanet Candidates

Over the next few years, TESS will detect thousands of exoplanets and even more eclipsing binaries. Due to the size of TESS's pixels, it is an inevitability that some will receive flux from more than a single star. In these cases it can be difficult to determine if a signal is due to a transiting planet around a target star or an eclipsing binary around a different star hidden within the aperture. But there is hope. Since TESS target stars are relatively bright and nearby, they are ideal targets for follow-up observation programs and large-scale stellar characterization missions (e.g., Gaia). By considering the information collected from these observations, we can identify and place constraints on the properties of all visible stars within a given TESS pixel and calculate the probability of each star hosting a transiting planet or eclipsing binary consistent with a given transit-like signal. By incorporating this process into a larger validation procedure, we can produce a tool that can reliably confirm or deny the existence of any exoplanet candidate.