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Title: A Survey for Very Short-Period Planets in the Kepler Data
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Abstract: A Survey for Very Short-Period Planets in the Kepler Data
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We conducted a search for very short-period transiting objects in the publicly available Kepler dataset, and this preliminary survey has revealed thirteen planetary candidates, with periods ranging from 3.3 to 10 hours. We have analyzed the data for these candidates using photometric models that include transit light curves, ellipsoidal variations, and secondary eclipses to constrain the candidates' radii, masses, and effective temperatures. Even with masses of only a few Earth masses, the candidates' short periods mean they may induce stellar radial velocity signals (~ 10 m/s) detectable by currently operating facilities. In this presentation, I will discuss how we conducted the survey and photometric constraints on the candidates. I will also discuss ongoing and planned follow-up observations and theoretical considerations regarding the origins of these candidates, if they are planets. Whatever their origins, if confirmed as planets, these candidates would be among the shortest-period planets yet discovered, and similar planets would be particularly amenable to discovery by the planned TESS mission. Continued surveying for such planets might also be feasible with the modified pointing capabilities of the Kepler spacecraft.