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Title: The Distribution of Water Content Amongst Earth-sized Habitable Zone Planets
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Abstract: The Kepler data provides tantalizing hints that Earth-sized planets with year-long orbital periods are common. However, to probe more deeply into whether small habitable zone (HZ) planets are indeed habitable we must understand whether conditions suitable for life exist. Given liquid water is usually considered necessary for life to begin, we undertook a project to determine the distribution of water content amongst Earth-sized HZ planets through a large suite of n-body simulations. We find that a significant fraction of candidate Earth-like planets will not be water rich, although a planet's water-mass fraction is strongly affected by when the planet accreted its mass - early or late. The statistical nature of our work allows our results to be easily folded into forthcoming computations of the frequency of Earth-like worlds in our Galaxy, resulting in a more robust understanding of our place in the Universe.