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The dehydration of water worlds via atmospheric losses. CHUANFEI DONG, Department of Astrophysical Sciences, Princeton University, ZHENGUANG HUANG, Center for Space Environment Modeling, University of Michigan, MANASVI LINGAM, Harvard-Smithsonian Center for Astrophysics, GABOR TOTH, TAMAS GOMBOSI, Center for Space Environment Modeling, University of Michigan, AMITAVA BHATTACHARJEE, Department of Astrophysical Sciences, Princeton University — In the last two decades, the field of exoplanets has witnessed a tremendous creative surge. Research in exoplanets now encompasses a wide range of fields ranging from astrophysics to heliophysics and atmospheric science. One of the primary objectives of studying exoplanets is to determine the criteria for habitability, and whether certain exoplanets meet these requirements. The classical definition of the Habitable Zone (HZ) is the region around a star where a planetary surface can support liquid water given sufficient atmospheric pressure, but this definition largely ignores the impact of the stellar wind and stellar magnetic activity on the erosion of an exoplanet's atmosphere. Amongst the many factors that determine habitability, understanding the atmospheric loss is of paramount importance. I will discuss the impact of exoplanetary space weather on the climate and habitability, which offers fresh insights concerning the habitability of exoplanets, especially those orbiting M-dwarfs, such as Proxima b and the TRAPPIST-1 system. I will focus on ocean planets, a unique class of planets with water-rich surfaces and atmospheres that do not currently exist in our Solar system. I will demonstrate the importance of the exoplanetary space weather on atmospheric ion loss and habitability.

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