Search for exoEarths around alphaCen with the TOLIMAN and future missions

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Abstract

The TOLIMAN mission will fly a low-cost space telescope designed and led from the University of Sydney. Its primary science involves an exhaustive search for temperate-orbit rocky planets around either star in the Alpha Centauri AB binary. By performing narrow-angle astrometric monitoring of the binary at extreme precision, any exoplanets betray their presence by gravitationally, engraving a tell-tale perturbation on the orbit. By implementing significant innovations optical and signal encoding architecture, the TOLIMAN space telescope aims to recover such signals with a telescope aperture of only a 12.5cm. This talk will describe the key features of the mission: its optics, signal encoding and the 16U CubeSat spacecraft bus in which the science payload is housed - all of which are now under construction. This program has generated lessons and concepts worth consideration for empowering next steps in precision astrometric measurement for exoplanetary science.

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