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## The 1.4 $\mu\text{m}$ water-vapor-absorption band imaging from Dome A

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The light at wavelength around 1.4  $\mu\text{m}$  is heavily absorbed by water vapor in the atmosphere creating a spectral gap between the  $J$  and  $H$  bands. However, Dome A's exceptionally dry conditions provide a unique opportunity for observations in this band. We developed a custom 1.4  $\mu\text{m}$  filter (1.34 to 1.48  $\mu\text{m}$ ), similar to JWST's F140M filter. After initial testing in Daocheng, China, the filter was installed on the Antarctica InfraRed Binocular Telescope (AIRBT) in January 2025. AIRBT consists of two identical 15 cm aperture, f/3 optical-tube-assemblies (OTAs), each equipped with an InGaAs camera (640512 pixels, 15  $\mu\text{m}$  pixel size). This configuration yields a pixel scale of 6.9 arcsec and a field-of-view of 1.2 deg \* 1 deg. AIRBT enables simultaneous observations in both  $J^*$  and 1.4  $\mu\text{m}$  bands. The scientific goal is to search for and study cool stars by detecting their water-vapor-absorption features. AIRBT had monitored some bright stars during polar day, and surveyed the Galactic plane during night-time. It had successfully detected water-vapor-absorption features in some late type stars. This talk will present the instrument design, observational strategy, data analysis, and preliminary results.

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