The Australian Antarctic Program utilises an integrated airborne imaging system with scanning LiDAR (Light Detecting And Ranging) and digital aerial photography for various purposes in East Antarctica, one of which is measurement of surface elevation of sea ice (ice freeboard) and glacial ice to estimate ice thickness. Information on the rate of change of ice thickness is vital for understanding the effects and feedbacks of a changing climate on polar regions. Such information is currently very sparse for the East Antarctic ice sheet, ice shelves, and the sea ice zone, with large-scale coverage latterly relying on satellite altimetric measurements that are unvalidated and uncalibrated.

Here we first describe the instrument system and then present initial \textit{in-situ} validation results acquired over sea ice in the vicinity of 122 deg East, 65 deg South. Drill-hole measurements of sea ice freeboard are shown to agree with airborne surface elevation measurements to within the centimetre-level. This allows confidence in the primary motivation of the project, which is to use the system to carry out large-scale aerial surveys (up to 200 km range) for the purpose of calibrating and validating space-borne sea ice thickness products, for example from CryoSat-2.