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The CAIRT earth explorer 11 mission: a way towards global gravity wave momentum budgets

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The changing-atmosphere infra-Red Tomography (CAIRT) mission candidate for ESA's earth explorer 11 proposes a limb imager for a spatial sampling of 25 km across-track, 50 km along-track, and 1 km in the vertical. From this, we expect to infer directional GW momentum fluxes, as well as trace gases, from the tropopause to 70 km or higher. This will allow longstanding scientific questions to be addressed such as the quantification of tropospheric GW sources and their related phase speed spectra and the identification of secondary wave generation in the stratosphere and lower mesosphere. Considering the momentum flux at higher altitudes, secondary wave generation competes with oblique GW propagation which allows GWs from low latitude sources to reach the high latitudes mesosphere and thus avoid critical levels. In this contribution, we will outline the CAIRT instrument concept, give an overview of the mission's objectives and demonstrate its potential using simulated observations.

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