The 2019/2020 QBO Disruption in ADM-Aeolus Wind Lidar Observations

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The quasi-biennial oscillation (QBO) is a regular cycle of alternating winds which dominates the behaviour of the tropical stratosphere. It is extremely technically challenging to model, and for this reason wind observations are vital to understand it fully. Characterised by downward propagating easterly and westerly regimes, the QBO progressed uninterrupted for more than 60 years until a highly anomalous deviation from its normal pattern in 2016. During 2019/2020, the start of a second disruption was seen in atmospheric analyses and radiosonde observations. Here, we exploit novel data from ESA’s ADM-Aeolus satellite to demonstrate its ability to measure the QBO in unprecedented detail. A special adjustment of Aeolus’ onboard range bin settings was implemented to observe this new disruption as it happened, providing a unique platform for studying the evolution of the event and the broader atmospheric effects triggered by it. In this presentation, we will show results from this special mode, highlighting how it has helped study the disruption, and how Aeolus and similar satellites can deepen our understanding of the QBO more generally.