

The life cycle of a Sudden Stratospheric Warming from infrasonic ambient noise observations

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Midwinter sudden stratospheric warmings (SSWs) leave a clear infrasonic signature, resulting from the drastic change in the stratosphere. This signature can be obtained passively by analysing the ambient infrasonic field. In this study, Arctic infrasound observations of stations IS18 and IS53 during the 2009 major SSW are re-analysed to better understand the signature of warming as a function of time. These stations are in place for the verification of the Comprehensive Nuclear-Test-Ban Treaty and part of the International Monitoring System. The back-azimuth shows the clearest effect, following the direction of the polar vortex. Directional time averaged amplitude plots reveal additional insight in the SSW life cycle, helping to better understand the phenomena. This technique can also be used to obtain information of the infrasound refraction altitude region, stratospheric or thermospheric, respectively, based on the presence of tidal fluctuations. A microbarom source model and atmospheric propagation model are used to verify those findings.