



Observations of polar stratospheric clouds over Iceland and their connection with winds and stability in the troposphere

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Forty years of synoptic observations of polar stratospheric clouds (PSC) over Iceland are analyzed. The PSC are most frequent in January, followed by December and February. Only a handful of observations have been made in November and March and none outside this period of the year. Observations of PSC are much more frequent in N- and E- Iceland than in SW-Iceland and there is large interannual variability in the occurrence of these clouds. An investigation of the atmospheric flow when PSC are observed reveal that in most cases, the conditions are very favourable for the generation of orographic gravity waves and propagation of these waves far upwards in the atmosphere. This suggests that localized cooling in the ascending part of a gravity wave may be crucial for the formation of most PSC over Iceland. This corresponds with the relatively low frequency of PSC over SW-Iceland: PSC are only observed when there are no or only few tropospheric clouds and under such conditions the low-level winds are usually from the north in SW-Iceland. In northerly flow, there is often a reverse windshear in the troposphere inhibiting upward propagation of wave energy.