Detection of the Conditions for Polar Stratospheric Cloud Formation During the Arctic Winter Using GPS Radio Occultations.

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Temperature profiles retrieved with the GPS radio occultation experiments aboard the CHAMP and SAC-C satellites during the 2001/2002 arctic winter are compared with predictions by NCEP analyses. Radio occultation data predicts that conditions favorable to polar stratospheric cloud (PSC) formation occur more often than suggested by the analyses. Independent data corroborate the occultation measurements. The improved prediction by radio occultations can be attributed to their higher vertical resolution which can detect sharp changes in temperature structure more effectively than the NCEP model. This higher vertical resolution detects situations under which a layering of thin PSCs can occur.