I. Observed Snow-AO Relationship

Using monthly NCEP/NCAR Reanalysis and NOAA, we can produce the observed snow-AO relationship. This is likely due to underestimation of EA during the winter season, as well as interannual variability. Analogous experiments with prescribed snow cover show significant results. However, the timing of the snow is critical, which may be due to the snow data in CAM.

Finally, we show that the snow-AO relationship exists for two subsequent winters, suggesting that in order to preserve the snow-AO relationship, we need to simulate the atmosphere where significant changes occur in the snow-AO relationship. This may indicate the importance of the snow-AO relationship in understanding the winter climate.

II. Physical Mechanism: Wave Activity Flux

It has been shown that the wave activity flux is closely related to the observed snow-AO relationship. Observations in the Northern Hemisphere show a strong correlation between the wave activity flux and the snow-AO relationship. This is likely due to the wave activity flux regulating the Rossby waves, which are important in the atmospheric circulation. The wave activity flux also interacts with the snow-AO relationship, indicating the importance of the snow-AO relationship in understanding the winter climate.

III. Physical Mechanism: Wave Activity Flux

IV. October Tropospheric Diabatic Response

CAM3 transient experiments from 1972-2006 were performed to investigate the diabatic response to varying greenhouse gases, mineral dust and volcanic aerosols, sea ice, and snow. These experiments show that the diabatic response is significant and that it is closely related to the snow-AO relationship. This is likely due to the diabatic response regulating the tropospheric circulation, which is important in the atmospheric circulation. The diabatic response also interacts with the snow-AO relationship, indicating the importance of the snow-AO relationship in understanding the winter climate.

V. Modeled (CAM3) Snow-AO

In order to understand the observed snow-AO relationship, we performed experiments with and without snow cover. These experiments show that the snow-AO relationship is closely related to the diabatic response. This is likely due to the diabatic response regulating the tropospheric circulation, which is important in the atmospheric circulation. The diabatic response also interacts with the snow-AO relationship, indicating the importance of the snow-AO relationship in understanding the winter climate.

VI. CAM3 SCA Deficiencies

Use of the CAM3 model to simulate the snow cover and diabatic response is essential in understanding the observed snow-AO relationship. This is likely due to the CAM3 model's ability to reproduce the observed snow-AO relationship. However, the CAM3 model shows deficiencies in simulating the diabatic response, indicating the importance of improving the CAM3 model in order to understand the winter climate.

VII. Prescribed Albedo (Snow) Experiments

VIII. AO Persistence & Snow

With a prescribed snow cover on the AO, we can investigate the effects of snow cover on the AO. We performed experiments with prescribed snow cover, and these experiments show that the snow cover has a significant impact on the AO. This is likely due to the snow cover regulating the diabatic response, which is important in the atmospheric circulation. The diabatic response also interacts with the snow cover, indicating the importance of the snow cover in understanding the winter climate.