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The observed multidecadal Northern Hemisphere climate change from the perspective of Damped Stratosphere/Troposphere-Ocean coupled Oscillation.

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The Northern Hemisphere (NH) climate has shown several multidecadal trends in the stratosphere/troposphere-coupled system, Ocean Sea Surface temperature (SST) and Sea/ice with big impact on the continental and Arctic climate. The most of these trends have been strongly damped and even reversed suggesting the importance of multidecadal climate variability in the NH climate change.
In this work we present the characteristics of observed multidecadal variability linking stratosphere/troposphere-coupled system, SST and arctic climate. Then we use a long-term forced coupled model to show that the characteristics of the observed NH multidecadal fluctuations including the Arctic climate change can be captured in the framework of damped delayed oscillatory linking the Northern Annular mode of the Coupled stratosphere/troposphere system with the North Atlantic Oscillation and Arctic sea-ice trough change in the overturning and wind-driven circulation. The mechanisms and characteristics of this damped delayed oscillation will be‘ presented in details.