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## **“Global Sea Ice Distribution and the Glacial Tempo”**

**ABSTRACT:** The proxy record of global temperature over the past million years strongly corresponds to eccentricity (100-kyr) and precession (23-kyr) signals, although annual mean insolation at a given location is not significantly influenced by these parameters. Contrary to the claim that precession and eccentricity are negligible in setting the pace of glacial cycles during the past million years, here we show that precession along with eccentricity can induce a substantial variation in global temperature because the growth of sea ice is asymmetrical between northern and southern hemispheres, with limited sea ice growth potential outside of the Arctic Circle. Preferential sea ice growth in the southern hemisphere under a climate similar to or colder than modern climate induces decreased total absorption of solar energy even if the total insolation is similar. The hemispheric asymmetry of the sea ice response decreases under warmer climates as mean Arctic and Antarctic sea ice decreases, diminishing the precession and eccentricity signatures and explaining the mid-Pleistocene transition toward the dominant obliquity signature (40-kyr).