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KEYNOTE: Trends, variability and drivers of the Southern Annular Mode during the last millennium

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Climate variability and change in the Antarctic region has far-reaching impacts. However, the large magnitude of internal variability and the brevity of reliable observational records makes it difficult to determine the significance of recent human-caused trends and to understand the role of natural forcings and internal variability on Antarctic climate. This presentation will review the current understanding of Southern Annular Mode variability and change during the last millennium. We show that methods for constructing the instrumental SAM index can account for much of the difference in magnitude of last millennium SAM reconstructions, and that applying strong solar forcing scenarios to last millennium climate simulations improves the agreement with reconstructed pre-industrial variability of the SAM. We further explore the role that changes in the mean state of SAM had on the magnitude of SAM variability and impacts across the Southern Hemisphere during the last millennium, and the implications that SAM trends and variability have for changing climate extremes in the 21st century.

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