

THE MESOSPHERE AS A LINK IN SUN-CLIMATE RELATIONSHIPS

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The mesosphere lies about 50-100 km altitude above the Earth. It is the coldest part of the atmosphere (~160K), absorbing little direct radiation from the Sun. The pressure in the mesosphere is about one millionth of that at the Earth's surface. Despite having some of the most spectacular optical phenomena – noctilucent clouds, meteor trails, sprites and elves and the aurora - it has not been extensively studied, being too high for balloon observations and too low for *in situ* satellite measurements. Therefore it is the least understood of the 'spheres'. Yet the mesosphere is the critical interface between the ionised atmosphere above and the neutral atmosphere below. Energetic particles, which originate either on the Sun or in the magnetosphere, change the chemistry in the mesosphere. Gravity waves, planetary waves and tides that are born in the troposphere and stratosphere are absorbed in, or reflected by, the mesosphere. These processes cause further dynamic changes throughout the atmosphere, and hence provide Sun-climate links. Vertical coupling in the atmosphere is a topic of emerging importance. The presentation will include examples of the top down and bottom up linkages, illustrations of how measurements are made of this remote region, and identify some of the pressing scientific challenges.

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