

### 青藏高原春季积雪在南海夏季风爆发过程中的作用

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**摘要** 本文应用欧洲中期预报中心(ECMWF, European Centre for Medium-Range Weather Forecasts—ERA-40)资料和美国国家环境预测中心和国家大气研究中心(NCEP/NCAR, National Centers for Environmental Prediction/National Center for Atmospheric Research)资料, 研究了青藏高原雪深变化对南海夏季风爆发的影响和ENSO对青藏高原降雪的影响. 结果表明: (1) ECMWF的雪深资料是可信的, 可以用来研究青藏高原雪深变化对南海夏季风爆发的影响; (2) 青藏高原的积雪异常影响到500 hPa以上的温度异常和印度洋与大陆间的气温对比, 一方面使上层的南亚高压移动速度发生变化, 另一方面也影响到低层大气的运动和东西向风异常, 在青藏高原少雪年, 东印度洋产生西风异常和一个气旋对, 而在青藏高原多雪年, 东印度洋产生东风异常和一个反气旋对; (3) ENSO与青藏高原春季积雪关系密切. 东太平洋SST正异常时, 东印度洋和南海气压偏高, 从而导致该区海陆经向压强梯度增强和西风异常. 另外, 此时青藏高原北部气压偏高, 北风偏强, 副热带锋面增强, 同时, 印度洋的SST偏高, 为青藏高原降雪提供了水汽保障, 这些都有利于青藏高原的降雪.

**关键词** [青藏高原](#) [积雪厚度](#) [南海夏季风](#) [厄尔尼诺](#)

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### Role of snow depth in spring of Tibetan Plateau in onset of South China Sea summer monsoon

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**Abstract** The role of snow depth of Tibetan Plateau in the onset of South China Sea summer monsoon and the influence of ENSO on snow depth of Tibetan Plateau are investigated with use of data from ECMWF reanalysis and NCEP/NCAR reanalysis. The results are as follows: (1) The snow depth data from ECMWF reanalysis are tested and reliable, and can be used to study the influence of snow depth of Tibetan Plateau on the onset of South China Sea summer monsoon; (2) Anomaly of snow depth of Tibetan Plateau causes anomaly in air temperature and its contrast between the Indian Ocean and the continent resulting in easterly wind anomaly over 500 hPa and hence as well as in the atmospheric circulation in the lower layer. For the year of negative anomaly of snow depth a westerly wind anomaly with a cyclone pair takes place, while for positive anomaly of snow depth an easterly anomaly occurs with an anticyclone pair; (3) While positive anomaly of SST occurs in the eastern Pacific Ocean, positive anomaly of air pressure also takes place over the eastern Indian Ocean and the South China Sea, causing stronger meridional pressure gradient between the ocean and continent and then westerly wind anomaly. At the same time, the atmospheric pressure increases in the northern Tibetan Plateau, northerly wind gets stronger, and subtropical front strengthens. All of these are favorable for snowfall over Tibetan Plateau.

**Key words** [Tibetan Plateau](#); [Snow depth](#); [South China Sea summer monsoon](#); [ENSO](#)

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