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## 地形云人工增雨条件卫星探测反演个例分析

### A case study of the conditions for topographic cloud seeding based on the retrieval of satellite measurements

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英文关键词: [Satellite retrieval](#) [Topographic cloud](#) [Conditions for cloud seeding](#) [Supercooled cloud](#)

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中文摘要:

选取2007年6月21日陕西白于山区地形云降水过程, 用极轨卫星资料反演高空间分辨率的云微物理特征。对云降水物理结构分析表明: (1) 山前云区(迎风坡)云顶亮温(T)为-31℃, 粒子有效半径(Re)为9μm, 含有丰富过冷水, 缺乏冰晶; (2) T=-20℃的低云在有高云参与的情况下, 产生了较多的降水; (3) 山前云区面积约4000 km<sup>2</sup>的区域, 存在较好的增雨作业条件。用静止卫星资料反演高时间分辨率的云微物理特征, 跟踪地形云3 h演变发现: 山前云区一直维持相当厚度(T<-28℃), Re基本稳定, 没有启动降水过程, 多数云滴仅完成了一个从凝结到蒸发的过程, 山前云区为一个好的增雨作业云系。

英文摘要:

Taking the precipitation processes occurred in 21 June 2007 at Baiyu mountainous area in the northern Shaanxi as an example, the microphysical properties of clouds were retrieved by the satellite retrieval methodology. From the orbital satellite data of higher spatial resolution, the retrieved microphysical structures show that on the windward side of the mountain, the cloud top temperatures are about -31℃, and the effective radii of the particles are around 9 μm, with more supercooled water and little ice crystal contained, and that the low clouds whose temperatures are about -20℃ produce more precipitation due to the involvement of higher clouds above them in the rain process. The cloud area on the windward of the mountain which is about 4000 km<sup>2</sup> brings about the good chance for the operational topographical cloud seeding. From the geostationary satellite data of higher temporal resolution, it is found, based on the three hour microphysical evolutions of clouds on the windward of the mountain, that the clouds had been maintaining rather deep, the effective radii of particles are stable, and no precipitation is triggered. Most cloud drops only experience the process transferred from diffusional growth to evaporation. All these suggest that the clouds on the windward of the mountain are the cloud system for the operational cloud seeding.

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