

### 月表有效太阳辐照度实时模型

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**摘要** 月表太阳辐射是深入研究月表温度分布的关键问题之一. 本文根据月表有效太阳辐照度与太阳常数、太阳辐射入射角以及日月距离之间的关系, 建立月表有效太阳辐照度的实时模型. 该模型在1950~2050年的100年内的理论误差百分比小于0.28%, 相对前人提出的模型在精度上有了很大程度的提高, 能较为真实地反映月表有效太阳辐照度随时间的变化规律. 计算结果表明2007年月表太阳辐照度的年变化范围在1321.5~1416.6 W·m<sup>-2</sup>之间, 平均为1368.0 W·m<sup>-2</sup>. 通过对月表太阳辐射入射角计算结果的分析, 证实了月球的两极可能存在极昼极夜.

**关键词** [月球](#), [月表](#), [太阳辐射](#), [模型](#)

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### A lunar surface effective solar irradiance real-time model

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**Abstract** Information about solar irradiance on the lunar surface is the key to understanding lunar surface temperature distribution. In this study, we have constructed a lunar surface effective solar irradiance real time model in terms of the relationship between solar irradiance and solar constant, solar radiation incidence angle and the Sun-Moon distance. The theoretical erroneous percentage of this model is less than 0.28% during 100 years from 1950 to 2050. These indicate that the model can accurately reflect the variation of effective solar irradiance on the lunar surface. The result showed that the total solar irradiance on the lunar surface would change from 1321.5 to 1416.6 W·m<sup>-2</sup> in 2007. And the average is 1368.0 W·m<sup>-2</sup>. We also validated the possibility of existing polar day and polar night at the lunar poles by analyzing the result of solar radiation incidence angle.

**Key words** [Moon](#), [Lunar surface](#), [Solar radiation](#), [Model](#)

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