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现代应用光学

航空多角度偏振辐射计的偏振定标

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摘要： 研究了航空多角度偏振辐射计的辐射定标方法, 以消除其自身引入的偏振效应,提高偏振辐射计的测量精度。首先,根据引入仪器偏振效应的主要因素推导了含定标系数的仪器探测方程,由仪器在0°和90°两个状态下对同一信号的探测方程求解了定标系数表达式,并设计了仪器分别处于两个状态下获取信号、求解定标系数的定标方法。最后,分别针对非偏振光源和完全线偏振光源的测试数据求解了所有的定标系数,使用可调偏振度光源验证了偏振定标结果。结果显示,该仪器偏振测量精度不低于0.5%,满足仪器精度指标要求。

关键词： 偏振遥感仪器 多角度偏振辐射计 偏振定标 偏振光源

Polarization calibration of airborne muti-angle polarimetric radiometer

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Abstract: The polarization calibration of an airborne multi-angle polarimetric radiometer was researched to eliminate the polarization effects induced by itself and to improve its measurement accuracy. First, instrument detection equations with calibration coefficients were derived according to the main factors that have been induced into the instrumental polarization effects, and the expression of calibration coefficients was solved based on the detection equations for the same signal when the instrument was fixed at states of 0癮nd 90?.Then, the calibration method to get the signals of the two instrument states and to solve the calibration coefficients were designed. Finally, the polarization calibration coefficients were computed from the measured data using a non-polarized light source and a completely linearly polarized one, respectively, and the polarized calibration results were verified by adjusting the polarization degree of the incident light. The results indicate that the instrument can offer a polarized measurement accuracy better than 0.5%, which meets the requirements of the instrument polarimetry.

Keywords: polarimetric remote sensing instrument multi-angle polarimetric radiometer polarization calibration polarized light source

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