

光电工程

反射式TDI CCD光学传感器波段选择

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摘要

光谱波段是光学传感器设计中需要考虑的一个重要指标。首先对探测海洋目标的反射式TDI CCD光学传感器需要选择的光谱波段进行分析,应用LOWTRAN 7软件对0.4 μm ~1.0 μm 波段的大气透过率进行了计算,同时对典型的海洋目标(如船体)、海水的光谱反射率及其对比度进行分析,最后对传感器的入瞳辐射亮度和信噪比进行了估算。计算结果表明:传感器光谱波段选择0.5 μm ~0.9 μm 波段,在入瞳辐射亮度和信噪比等方面优于选择0.5 μm ~0.8 μm 波段。这一结论为实用系统的波段选择提供了依据。

关键词 [应用光学](#) [TDI CCD](#) [光学传感器](#) [光谱波段](#) [信噪比](#)

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Selection of spectral waveband for reflective TDI CCD optical remote sensor

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Abstract The spectral waveband is an important factor to be investigated in optical remote sensor design. The spectral waveband suitable for the reflective TDI CCD optical remote sensor to detect oceanic objects is analyzed. With LOWTRAN 7 software, the atmospheric transmittance in the waveband of 0.4 μm ~1.0 μm was calculated, the spectral reflectivity and contrast of typical oceanic targets (e.g. ship hull) and seawater was analyzed, the entrance-pupil radiance and the SNR of the remote sensor were estimated, and then the optimal detection waveband was selected. The calculation result shows that it is better to select the waveband of 0.5 μm ~0.9 μm than that of 0.5 μm ~0.8 μm considering entrance-pupil radiation intensity and SNR of the remote sensor. This conclusion can be used to support the waveband selection for the system with similar applications.

Key words [applied optics](#) [TDI CCD](#) [optical remote sensor](#) [spectral waveband](#) [SNR](#)

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