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Titolo	CHARACTERIZATION OF ATMOSPHERIC AEROSOLS EXPLOITING SATELLITE MULTISPECTRAL OPTICAL IMAGING. APPLICATIONS TO RADIATIVE TRANSFER FOR DOWNSTREAM SERVICES IN THE FIELDS OF RENEWABLE ENERGY AND HEALTHCARE [Tesi di dottorato]
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Sommario	This Thesis presents some of the most important results obtained in the PhD that concern with multispectral satellite remote sensing, radiative transfer modelling, aerosol optical properties and some related applications. The research activities have been supported by and performed in collaboration with Flyby S.r.l., a small Italian company devoted to applied research and innovative technology development in remote sensing that fully funded the PhD. The effects of atmospheric aerosols on the solar radiative transfer have been investigated by exploiting both satellite optical imagery and ground-based solar radiation measurements. In particular cloudless-sky conditions have been taken into account in order to focus aerosols impact on radiative transfer avoiding the clouds related effects. The simultaneous observation of solar radiation “below” and “above” the aerosols layer in cloudless-sky conditions showed a correlation between aerosols amount in the atmosphere (revealed also by ground-based measurements) and the spectral radiance observed by two infrared channels of the satellite optical sensor. This has been extremely important for the development of an innovative method for the satellite-based near real-time solar radiation

	monitoring taking also into account aerosols impact. Besides, also the effects of clouds on solar radiation have been modelled, leading to several applications in the fields of renewable energies and healthcare. In particular a methodology for the near real-time monitoring of the performances of solar energy plants has been developed: satellite-based solar irradiance at ground and an analytic modelling of the solar plant allows a near-real time evaluation of plant's performances. Moreover, an application dedicated to the satellite-based monitoring of UV effects on human skin has been developed. This application starts from the near-real time calculation of UV erythemal dose and provides a "safe sun exposure time" for avoiding sunburns or other skin diseases (such as melanoma).
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