1. Record Nr. UNINA9910633982003321 Autore Stantchev Rayko Ivanov Titolo Spatial Terahertz-Light Modulators for Single-Pixel Cameras / / written by Rayko Ivanov Stantchev and Emma Pickwell-MacPherson London:,:IntechOpen,, 2021 Pubbl/distr/stampa **ISBN** 1-83962-684-4 Descrizione fisica 1 online resource (202 pages) Disciplina 543.5 Soggetti Terahertz spectroscopy Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di contenuto 1. Introduction -- 2. Single-pixel imaging theory -- 3. Spatially modulating THz radiation -- 3.1 Mechanical masks -- 3.2 THz modulation by charge carrier injection/depletion -- 3.2.1 Optical modulators -- 3.2.2 Electrical modulators -- 3.3 Spatially patterned THz generation -- 3.4 Liquid crystal THz modulators -- 4. Applications and discussion -- 5. Conclusions -- Acknowledgments -- Conflict of interest -- Nomenclature -- References. Sommario/riassunto Terahertz imaging looks set to become an integral part of future applications from semiconductor quality control to medical diagnosis. This will only become a reality when the technology is sufficiently cheap and capabilities adequate to compete with others. Single-pixel cameras use a spatial light modulator and a detector with no spatialresolution in their imaging process. The spatial-modulator is key as it imparts a series of encoding masks on the beam and the detector measures the dot product of each mask and the object, thereby allowing computers to recover an image via post-processing. They are inherently slower than parallel-pixel imaging arrays although they are more robust and cheaper, hence are highly applicable to the terahertz regime. This chapter dedicates itself to terahertz single-pixel cameras; their current implementations, future directions and how they compare to other terahertz imaging techniques. We start by outlining the competing imaging techniques, then we discuss the theory behind single-pixel imaging; the main section shows the methods of spatially modulating a terahertz beam; and finally there is a discussion about

the future limits of such cameras and the concluding remarks express the authors' vision for the future of single-pixel THz cameras.