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Nota di contenuto	Chapter 1. Introduction -- Chapter 2. Literature review -- Chapter 3. Small UWB antipodal Vivaldi antenna with improved radiation characteristics for microwave and millimetre wave imaging applications -- Chapter 4. Microwave and millimetre wave antipodal Vivaldi antenna with periodic slit edge technique and the trapezoid shaped dielectric lens for imaging of concrete-based composite materials -- Chapter 5. Antipodal Vivaldi antenna with regular triangular-shaped slits for microwave imaging of concrete materials and structures -- Chapter 6. Miniaturised antipodal Vivaldi antenna and its application for detection of void inside concrete specimens -- Chapter 7. Comb-shaped slits antipodal Vivaldi antenna and its application detection of void inside concrete specimens -- Chapter 8. Conclusion and suggestions for future work.
Sommario/riassunto	The research described here develops and applies novel, ultra-

wideband (UWB) antipodal Vivaldi antennas for high-resolution detection of defects and damages in composite construction materials and structures using their microwave and millimeter wave imaging. The author examines the challenges of applying the UWB microwave technique in that the technique is dependent on the operating frequency used for the specified material under test. In this context, the objectives of this research volume include, but are not limited to, development of a small UWB antenna at frequency range from 5 GHz - 50 GHz for microwave and millimeter wave imaging of wide range of low loss construction materials, design of a small UWB antenna operating for microwave and millimeter wave imaging of low loss and high loss materials for the purpose of detection of surface damages of concrete under low loss materials, and development of a UWB antenna at frequency range from 2 GHz - 27 GHz for microwave imaging of low loss and high loss materials such as concrete structures and layered structures for the purpose of detection of cavities inside concrete. Introduces a novel sketch of antipodal Vivaldi antennas with dielectric lenses; Tests workability of the designed antennas for different specimens of construction materials and structures; Considers capability of the designed antennas to detect different targets inside construction materials and structures. .

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