

# Sensing with Curved Terahertz Beams

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## Abstract

Joint sensing and communications (JSAC) is a concept in which wireless systems use RF signals for both transmitting and receiving data and for environmental sensing and awareness. Due to the unique sensing capabilities enabled by radiation above 100 GHz, including high resolution in both range and cross-range radar, the JSAC paradigm has become one of the key motivations for incorporating these high-frequency signals into future generations of wireless technology. In many implementations especially in indoor scenarios, such systems will operate in the electromagnetic near field of the transmitting aperture, as the near field range increases in inverse proportion to the wavelength, and can easily exceed 10m for a realistic antenna configuration. Thus, one is naturally led to the notion of employing near-field wavefronts for sensing, a topic which has so far attracted little attention at lower frequencies due to the relatively restricted range of the near field for frequencies below 10 GHz. This talk will review some of the exciting possibilities afforded by the use of self-accelerating THz beams such as Airy beams for sensing, which complement their use for obstacle avoidance in line-of-sight communication links.