

Improvement of Angular Resolution of a Millimeterwave Imaging System by Transmitter Location Multiplexing

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Angular resolution and the angular width of the field of view are in the frame of Autonomous Intelligent Cruise Control (AICC) critical system parameters. A promising solution which avoids conventional phased array techniques is to use an array of receivers and the methods of digital beam forming in order to extract the complete 2D radar information. Angular resolution is in this case closely related to the number of receiving antennas respectively downconverters. A complete AICC - systems working on these principles using four receivers has been built and published elsewhere. This paper shows that angular resolution can be improved at least by a factor of two without increasing the number of antennas and receivers by multiplexing the transmitter location. Two different configurations are compared. A very cost-effective way is to realize the necessary switching operations in the IF-band. Linear prediction algorithms are applied to fill the arising gap, leading to the full expected lateral resolution while maintaining sufficient side-lobe suppression.

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