Abstracts

A Space-Fed Local Oscillator for Spaceborne Phased Arrays

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Lightweight, spaceborne phased arrays require both local oscillator signal distribution and compensation for mechanical deformations that dynamically occur in orbit. These array deformations are expressed by a sum of the time and amplitude weighted characteristic mechanical nodes of the array structure, and their effects on the array pattern differ from the effects of random phase perturbations assumed in classical antenna tolerance theory. A space-fed local oscillator concept can partially compensate the effects of array deformations to reduce array pattern degradation. This concept also offers potential weight reduction of the array design and reduced deployment complexity. This concept uses a local oscillator radiator on the back side of the array along with a series of local oscillator pickup elements connected to the array elements.

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