

SYSTEM AND METHOD FOR ENHANCING DYNAMIC RANGE OF A BEAMFORMING MULTI-CHANNEL DIGITAL RECEIVER

Abstract

5 A system and method for enhancing a dynamic range of a beamforming multi-channel digital receiver are described. The receiver comprises a plurality of receiving channels, each including an analog-to-digital converter configured for converting an analog input signal generated by antenna elements into a digital signal. A “spatial” dither signal is used to decorrelate the quantization noise of the analog-to-digital
10 converters. A dither signal is generated and split into a predetermined number of coherent dithering signals. The method includes providing predetermined time delays to the coherent dithering signals, and adding the delayed coherent dithering signals to the input signals in each receiving channel, correspondingly, thereby creating a dither signal equivalent to a signal arriving from a certain specific direction out-of-field-of-
15 view of the antenna array. Removing of the dither signal based on the direction of arrival, is implemented during beamforming signal processing, thus enhancing the dynamic range of electromagnetic signals arriving within a field-of-view of the antenna array.

20 Fig. 1