Comparing the “Rim” Versus the “Filled” Rectangular Array Grids—Their Direction-Finding Cramér-Rao Bounds

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Abstract
A rectangular array of sensors is often used in direction finding, due to the geometric regularity in its spatial rectangular grid. The sensor positions may be confined to the rectangle's perimeter (as in a “rim” array), or may span over the rectangle's entire interior as well (as in a “filled” array). This paper compares these two array grids by their precision in direction finding, by pioneering Cramér-Rao bound expressions for both array grids above, in closed forms and explicitly in terms of the array parameters.