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Editorial

Advances in Antenna Array Processing for Radar 2016

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RAP (Radar Array Processing) is a very active, open, and concerned topic in the field of radar. It is of great significance to promote the progress of radar theory and technology. Although the RAP has experienced five decades of research, it still represents a fascinating discipline with great development potential.

At present, the rapid development of advanced radar processing techniques is closely related to the RAP. The former includes STAP (Space-Time Adaptive Processing), MIMO (Multiple-Input Multiple-Output) radar, multichannel SAR (Synthetic Aperture Radar), adaptive detection, radar ECCM (Electronic Counter-Countermeasure), and so forth.

PAR (Phased Array Radar), MIMO radar, MIMO-PAR, and digital array radar are suitable for constituting the multichannel system due to their inherent antenna structure. Consequently, we could fully apply a variety of advanced RAP techniques to these radars.

So far, the RAP has obtained fruitful achievements in theory and algorithm respects. However, the research and development on application, system, engineering, implementation of hardware, and so on are still far from enough. And those are just what researchers and radar engineers are particularly concerned about.

The study on RAP should adopt a "systemic" point of view. In other words, it should not be regarded simply as a specific theory, algorithm, or technique issue but should be considered under a uniform radar system framework. That is, we should incorporate RAP into adaptive detection, parameter estimation (such as adaptive monopulse), and data processing (such as adaptive tracking); consequently, the capabilities of the RAP could be assessed in the whole system.

In this 2016 special issue, we have collected papers covering the following aspects of RAP research and development: parasitic array receiver for ISAR imaging of ship targets using coastal radar, robust adaptive beamforming using low-complexity steering vector estimation and a covariance matrix reconstruction algorithm, FPC-root algorithm for 2D-DOA estimation in sparse array, and design of the microstrip reflect array antenna by optimizing the reflection phase curve.

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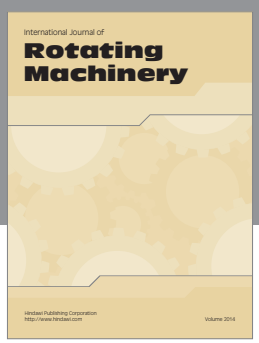

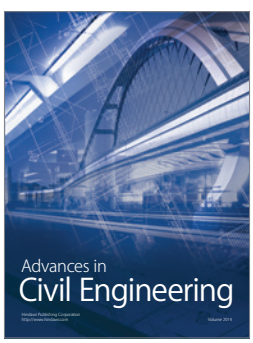

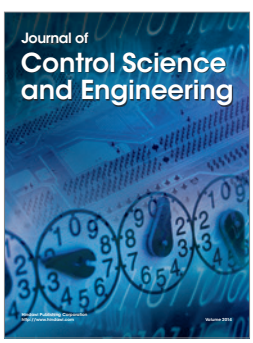

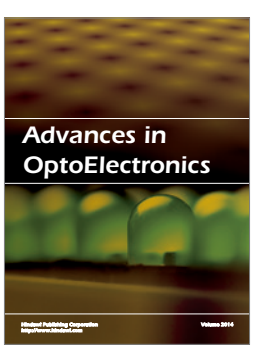

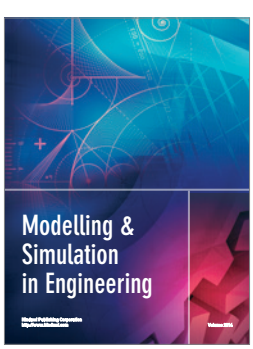

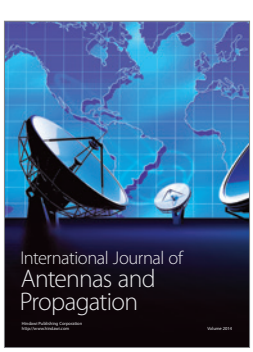

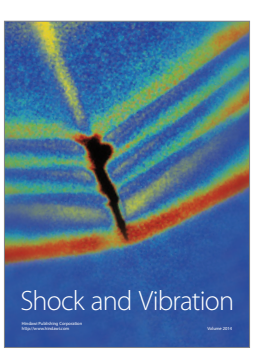

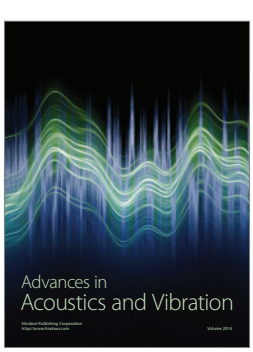

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