Antenna Design Using Characteristic Modes and Related Techniques.

Comment on the presentation by Mittra et al. "Systematic Design for Synthesis and Control of Radiation Patterns of Antennas Mounted on Complex Platforms," in EuCAP'16 Special Session on Theory and Application of Characteristic Modes, convened on Monday, April 11, 2016

It is not clear to this listener of the above presentation that this paper even belonged to the Sp. Session on CMs, since it appeared to criticize the CM approach more than it said anything positive about it. Furthermore, it appeared to recommend a completely different approach to pattern synthesis rather than following the CM approach. This listener has several questions about this paper. The list appears below:

Questions and Comments

1. It appears that the authors address the question of location of the antennas (or ECEs, if you prefer to call them that) up front. But, how can they guarantee that the desired CMs would be excited, and hence the desired pattern would be realized, by following the procedure they recommend?
2. Did they find situations where they couldn't synthesize the pattern specified by the user, and what do they recommend doing about it when that happens?
3. It appears that the CBFs (Characteristic basis functions) are source-dependent and are different in general from the CMs, except for some special cases, e.g., thin wires with plane wave (and not voltage gap) excitations. How can we produce the CMs we want to excite when we are dealing with a more general geometry, if we are chosen to go with the CB route as a starter?
4. Why don't the authors employ an optimization procedure to determine the weight coefficients of the CBs, rather than solving an eigenvalue problem to find them?
5. How do they handle the situation if the eigenvalues are complex?
6. Do the authors really believe that their approach is better than the CM method? If so, can they explain in which ways it is so?

Submitted by: A CM enthusiast