

### **“Scale changing technique: a design tool for reflectarray active cells”**

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**Abstract** – A new method called the Scale Changing Technique (SCT) is used in the design and optimisation of an elementary reflectarray cell presenting 1024 available states. Its competitive computation time to determine the main characteristics of a reflectarray cell (the dynamic range and maximum phase-shift) with attenuation consideration has proved to be very useful. The phase range and maximum phase-shift are discussed according to MEMS electrical characteristics and dielectric substrate. Technical considerations such as MEMS failure are also investigated. An elementary reflectarray cell with a phase range of  $359^\circ$  and a maximum phase-shift of  $6.8^\circ$  is designed with this tool. The MEMS specifications and substrate are analysed according to respected specifications.