

## SUPERSTRATE-BASED LOW RCS CAVITY-BACKED ARCHIMEDEAN SPIRAL ANTENNA

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*Spiral antennas are frequency independent antennas with broadband operating frequency range and are used in fighter aircraft for direction finding applications. This work presents the electromagnetic (EM) design of low observable right-handed circularly polarized (RHCP) cavity-backed Archimedean spiral (CBAS) antenna with VSWR <2.3, axial ratio <3 dB and positive gain over 2-18 GHz. In order to reduce radar cross-section (RCS) of the designed spiral antenna, a three-layered metasurface-based superstrate have been placed at an optimum height. It is shown that addition of superstrate over the CBAS antenna has not degraded the antenna radiation performance in terms of reflection coefficient, VSWR, gain and axial ratio. The monostatic RCS of CBAS antenna with and without superstrate is simulated over 1-18 GHz for normally incident RHCP EM wave. On average, 3 dB RCS reduction has been achieved over 4-18 GHz.*

**Keywords:** Archimedean spiral antenna, superstrate, reflection coefficient, VSWR, axial ratio, gain, monostatic RCS

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