Abstracts

An octave bandwidth monopulse processor

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An octave bandwidth monopulse processor has been designed to operate from 2 to 4 GHz. The design is based on a new architecture in which two 90/spl deg/ delay lines and a 0 dB coupler are used in the monopulse circuit. The 2-4 GHz bandwidth is obtained in the difference port in which the dispersion due to the two 90/spl deg/ delay lines cancels. The simulated results demonstrate a 20 dB null depth over a 2 GHz bandwidth and a sum variation of 1 dB when using Lange couplers for the 0/spl deg//90/spl deg/ hybrid. The monopulse processor was fabricated on a 510 /spl mu/m high resistivity silicon substrate. The measured results indicate an 18 dB null over a 2 GHz bandwidth and a 30 dB null over a 0.95 GHz bandwidth centered at 2.6 GHz with a 2 dB variation in the sum pattern. This novel monopulse circuit can be used in millimeter-wave wideband radars (8-16 GHz, 20-40 GHz) or in novel IF-based monopulse systems.

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