

## Low Probability of Intercept (LPI) Signal Detection and Analysis Using Choi-Williams Distribution

**Authors :** V. S. S. Kumar, V. Ramya

**Abstract :** In the modern electronic warfare, the signal scenario is changing at a rapid pace with the introduction of Low Probability of Intercept (LPI) radars. In the modern battlefield, radar system faces serious threats from passive intercept receivers such as Electronic Attack (EA) and Anti-Radiation Missiles (ARMs). To perform necessary target detection and tracking and simultaneously hide themselves from enemy attack, radar systems should be LPI. These LPI radars use a variety of complex signal modulation schemes together with pulse compression with the aid of advancement in signal processing capabilities of the radar such that the radar performs target detection and tracking while simultaneously hiding enemy from attack such as EA etc., thus posing a major challenge to the ES/ELINT receivers. Today an increasing number of LPI radars are being introduced into the modern platforms and weapon systems so these LPI radars created a requirement for the armed forces to develop new techniques, strategies and equipment to counter them. This paper presents various modulation techniques used in generation of LPI signals and development of Time Frequency Algorithms to analyse those signals.

**Keywords :** anti-radiation missiles, cross terms, electronic attack, electronic intelligence, electronic warfare, intercept receiver, low probability of intercept

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