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Advanced Radar Waveforms Generation and Processing using Software Defined Radio (SDR)

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The optimum choice of radar waveforms has a great effect on radar performance. Phase and frequency modulated radar waveforms are commonly used in advanced radar systems to achieve long range detection and high resolution through Pulse Compression (PC). Generation and processing of these advanced complex radar waveforms require flexable, reliable, and controllable hardware systems. Software Defined Radar (SDR) is one of the advanced tools which can be used to achieve these requirements. In this paper, generation and processing of Barker phase coded radar signal is introduced. Implementation and testing of the proposed hardware is achieved using SDR based on Field Programmable Gate Array (FPGA). The proposed system can be used to generate and process arbitrary radar waveforms in an easy and flexible manner.