

## RESEARCH ON M-ARY ARP-VMAP MODEM

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### ABSTRACT

In order to improve the spectral efficiency of asymmetry, random-polar and very minimum amplitude and phase (ARP-VMAP) modulated signal, an M-ary ARP-VMAP (MARP-VMAP for short) modulation method is proposed by introduction of the M-ary technology. Firstly, the principle of MARP-VMAP modulation and the two specific modulation methods are demonstrated, namely, MARP-VMAP-I modulation and MARP-VMAP-II modulation, and the modulator model is also given. Then, based on the special filtering mechanism of impacting filter, the demodulator utilizing multi-discrimination is introduced. Finally, The contrast and analysis of the power spectrum, the -60dB bandwidth, the spectral efficiency, and the demodulation performance among ARP-VMAP-I modulation, ARP-VMAP-II modulation, MARP-VMAP-I modulation and MARP-VMAP-II modulation, are carried out. Simulation results show that remaining the same spectrum structure and shape, the new modulation method can multiple the information transfer rate and the spectrum efficiency, and control the loss of demodulation performance about 0.6dB.

**Keywords:** Asymmetry random-polar and very minimum amplitude and phase modulation, Spectral efficiency, M-ary technology, Impacting filter, Demodulator.