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Transforming physics learning via Research & Practice
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Amplitude Modulation Measurements using Mobile Device Sensors

Monday 30 June 2025 16:30 (1 hour)

This study explores an innovative approach utilizing mobile-based spectrum analyzer applications to visualize and analyze Amplitude Modulation (AM) signals. The methodology involves generating an AM signal using a modulator circuit and capturing the output through the mobile device's microphone. The acquired signal is then processed using mobile spectrum analyzer applications, which employ fast Fourier transform (FFT) techniques to extract carrier frequency, sidebands, and modulation index. This approach enables cost-effective and portable AM analysis, making the experiment more accessible for students and researchers. The proposed technique not only democratizes access to AM signal analysis but also aligns with the advancement of mobile-assisted experimental techniques in education. The results demonstrate that mobile spectrum analyzers provide sufficient accuracy for fundamental AM parameter measurements, proving to be an efficient alternative to traditional benchtop analyzers. This work underscores the potential of integrating smartphone-based measurement tools in communication engineering laboratories, fostering an innovative and scalable approach to hands-on learning.

Education level

Age 15-18 (Secondary education)

Physics topic

Contemporary and modern physics

Research focus

Active learning

Research method

Analytic Physics Education Research (Quantitative research)

Organizing preference criteria

Research focus

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