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Paper Title: Efficient Physical Feature Extraction for Low-SNR MR Image Restoration

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## Abstract

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Magnetic resonance (MR) image restoration holds great promise in clinic to transition from low signal-to-noise ratio (SNR) and low-resolution (LSLR) images to high SNR, high-resolution (HSR) images, reducing scan time without compromising quality. Nevertheless, current deep learning-based restoration approaches excel mainly in high SNR scenarios, struggling in low SNR conditions due to the intricate amalgamation of noise and delicate structures. In this work, we introduce a novel MR image restoration method that capitalizes on the collaborative potential of multi-coil physical priors, effectively demarcating noise from intricate structures. Specifically, a coil feature extraction module (CFEM) was designed to fully exploit the prior from multi-coil images. Experiments on in vivo MR data demonstrate that the proposed method incorporating the physical prior performs well in high and low SNR scenarios and achieves superior performance over other compared methods.

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