Redefining MRI:
From Image to Insight

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Updates in Metal Artifact Reduction in MRI

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The substantial difference in magnetic susceptibility between metal and human tissues causes severe distortion of the applied main magnetic field around metal, which can be larger than typical magnetic field variations at air-tissue interfaces by an order of magnitude or more. This severe magnetic field distortion, beyond correction with shimming techniques in commercially available MRI scanners, breaks down the fundamental assumptions about the magnetic field and spatial coordinates we use for MRI signal acquisition and reconstruction. Severe signal loss, pile-up, and displacement artifacts around metal are direct consequences of MRI scans that do not compensate for this severe magnetic field distortion. This presentation will briefly cover the basic physics of metal artifacts, the history of metal artifact correction techniques, and an introduction to 0.55T MRI, which offers a new opportunity to improve metal artifact correction further.