

Magnetic Resonance Fingerprinting with dictionary-based fat and water separation (DBFW MRF)

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The purpose of this work is to obtain quantitative MRI maps of fat and water with a fast acquisition for musculoskeletal imaging applications. Conventional fat separation methods are based on steady-state signal models, relying either on relaxometry or chemical shift. A recent approach for parameter mapping, called magnetic resonance fingerprinting (MRF), uses transient-state acquisitions, comparing them with pre-computed simulations in search of the best match. Here, we build on recent MRF work by including a multi-component fat and water signal model. By using a full simulation, we can combine relaxometry and chemical shift fat separation within a single acquisition. We demonstrate robust fat fraction estimation, with a simultaneous T1, B1+ and B0 map. These were in good agreement with previous approaches, but achieving a significant speedup.

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