

Beyond the diffusion tensor model: The package dti

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Diffusion weighted imaging is a magnetic resonance based method to investigate water diffusion in tissue like the human brain. Inference focuses on integral properties of the tissue micro structure. The acquired data are usually modeled using the diffusion tensor model. Since the homogeneity assumption behind this model is invalid in large portion of the brain voxel more sophisticated approaches have been developed.

We discuss strategies for modeling diffusion weighted MR data using the concept of an orientation distribution function. The package **dti** is used to illustrate characteristics of the data, to analyze artificial and experimental data, and to discuss properties and interpretation of results. We focus on recent extensions of the package including Q-ball imaging and tensor mixture models.

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