# Quarklet Characterizations for Triebel-Lizorkin spaces

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In this talk we present a characterization in terms of quarklets for the Triebel-Lizorkin spaces. For that purpose in a first step we define the Triebel-Lizorkin spaces $F^s_{r,q}(\mathbb{R})$. Here we use the Fourier analytical approach and work with a smooth dyadic decomposition of the unity. In a second step we construct the quarklets. To this end we deal with cardinal B-splines. They can be used to assemble biorthogonal compactly supported B-spline wavelets. Here we apply the construction of Cohen, Daubechies and Feauveau presented in 1992. Those wavelets can be employed to obtain the quarklets. For that purpose we enrich the B-spline wavelets with polynomials of degree $p \in \mathbb{N}_0$. In the third part of the talk we use the quarklets to characterize the Triebel-Lizorkin spaces. So it turns out that under some conditions on the parameters a function belongs to a Triebel-Lizorkin space $F^s_{r,q}(\mathbb{R})$ if and only if it can be represented in terms of quarklets. In connection with that we also obtain a new equivalent quasinorm for the Triebel-Lizorkin spaces.