# Multivariate Quarklets in the Context of Bessel-Potential Spaces on Unit Cubes

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In this talk it is our main goal to describe multivariate Bessel-Potential Spaces defined on cubes via spline quarklets. For that purpose in a first step we recall the construction of univariate quarklets which have been introduced in the last decade in [3]. Those quarklets are based on biorthogonal compactly supported Cohen-Daubechies-Feauveau spline wavelets that have been enriched with polynomials. Boundary adapted versions of the quarklets can be used to characterize univariate Bessel-Potential spaces $H^s_r((0,1))$ defined on intervals. To obtain multivariate quarklets we apply tensor product methods. It is well-known since many years that multivariate Sobolev spaces $H^s_2(\Omega)$ defined on cubes can be written as an intersection of function spaces which have a tensor product structure, see [4] and [1]. Very recently Hansen and Sickel found that such decompositions also hold in the case of more general Bessel-Potential spaces $H^s_r(\Omega)$ with $1 < r < \infty$. Consequently we can use univariate quarklets in combination with tensor product methods to obtain multivariate quarklet characterizations for Sobolev and Bessel-Potential spaces defined on unit cubes, see [2] for the case of Sobolev spaces.

## References


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