Optimal Quadrature on Fractional Spaces

Yannick Meiners
Uni Osnabrück

We study the integration problem over the s-dimensional unit cube on spaces of fractional smoothness $0 < a < 1$ in the sense of Riemann-Liouville. Previously upper error bounds for the worst case error of QMC-quadrature rules based on (t, m, s)-nets were proved for these spaces. We show via suitable function space embeddings that these error bounds cannot be improved and that these QMC-quadrature rules are indeed optimal. In particular, we establish that the fractional spaces are equal to the Bessel potential spaces with the same parameters in the sense of equivalent norms. Joint work with Michael Gnewuch.