Continuum limit of discrete Fourier multipliers

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Abstract

This talk concerns a recent collaboration with Arne and Horia, on norm resolvent convergence of a discrete operator on a square lattice (Fourier multiplier plus a potential) to its continuum counterpart, with an explicit convergence rate in the lattice parameter. The resolvent of the discrete operator is embedded into the continuum using biorthogonal Riesz sequences. Consequently, we obtain spectral estimates for the difference of the resolvents, and local spectral estimates for the original operators. An admissible choice of Fourier multiplier is e.g. the fractional Laplacian, while the potential is assumed to be real, bounded, and Hölder continuous.