

FRAME-BASED MULTI-SCALE GAUSSIAN BEAMS, WAVEFIELD APPROXIMATION AND BOUNDARY  
VALUE PROBLEMS

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We present a construction of a multi-scale Gaussian beam parametrix for the Dirichlet boundary value problem associated with the wave equation, and study its convergence rate to the true solution in the highly oscillatory regime. The multi-scale Gaussian beams follow a wave-atom-like decomposition of phase space. They can form a frame. However, for the mentioned construction we need to introduce a notion of well-spread families of multi-scale Gaussian beams. We show an application of this result in reverse-time-migration type imaging with wavefield reconstruction of seismic array data.

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