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Optimization-Based Approach for Tomographic Inversion from Multiple Data Modalities

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Fluorescence tomographic reconstruction can be used to reveal the internal elemental composition of a sample while transmission tomography can be used to obtain the spatial distribution of the absorption coefficient inside the sample. In this work, we integrate both modalities and formulate an optimization approach to simultaneously reconstruct the composition and absorption effect in the sample. Furthermore, we applied multigrid-based optimization framework to speedup the performance. Improvements of accuracy and convergence rate have shown for several examples.