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On the regularization of an inverse vibration problem with noisy data

We consider a linear operator equation with noise in the operator and the right-hand side. As a concept, the ill-posedness of the problem is composed of the ill-posedness with respect to the operator and the ill-posedness with respect to the right-hand side, and in both cases the ill-posedness can be characterized by an embedding operator. Starting at a numerical procedure for exact data, in the case of noisy data a numerical procedure and error estimates are given. As an example, a first kind Volterra integral equation is investigated and finally applied to a point source reconstruction problem for the wave equation.