

1161-93-111

Ahmet Ozkan Ozer* (ozkan.ozer@wku.edu), 1906 College Heights Hill Blvd, Department of Mathematics, Bowling Green, KY 42101. *Investigation of the uniform boundary observability of finite difference approximations of several beam equations with only one boundary observation.* Preliminary report.

First, a space-discretized Finite Difference approximation for the beam equations is introduced. These equations mainly describe transverse vibrations for single or mutli-layer beams. With only one boundary controller, even though these equations are known to be exactly observable, their Finite Difference approximations are not able to mimic the exact observability with respect to the discretization parameter. This is mainly due to the loss of the uniform gap among the eigenvalues of the approximated finite dimensional model. Lack of observability is proved. To obtain a uniform gap, and therefore, an exact observability result, we consider a direct filtering technique. Current and future research will also be discussed. (Received August 13, 2020)