

## Control and stabilization of waves on heterogeneous meshes

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We will consider the control problem through the right endpoint of the space interval for the approximation of the  $1 - d$  wave equation by finite differences and finite elements on regular non-uniform meshes obtained by mapping the uniform grid using smooth concave applications. Even if on uniform meshes the observability inequality is not uniform with respect to the mesh size, in our case, the progressively refinement of the mesh when approaching the controlled endpoint will correct this lack of uniformity [1]. We will also present some extensions of these results on some more irregular meshes, quadratic finite elements, higher dimensions, beam equation and stability problems.

### References

- [1] S. Ervedoza, A. Marica, E. Zuazua, Numerical meshes ensuring uniform observability of one-dimensional waves: construction and analysis, *IMA Journal of Numerical Analysis*, 36 (2) 503, 2016.

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