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APPROXIMATION OF WAVES WRITTEN IN MIXED FORM IN TIME DEPENDENT DOMAINS

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Working with the wave equation in mixed rather than irreducible form allows one to directly account for both, the acoustic pressure field and the acoustic particle velocity field. Indeed, this becomes the natural option in many problems, such as those involving waves propagating in moving domains, because the equations can easily be set in an arbitrary Lagrangian-Eulerian (ALE) frame of reference. Yet, when attempting a standard Galerkin finite element solution (FEM) for them, it turns out that an inf-sup compatibility constraint has to be satisfied, which prevents using equal interpolations for the approximated acoustic pressure and velocity fields. In this work it is proposed to resort to a subgrid scale stabilization strategy to circumvent this condition and thus facilitate code implementation. As a possible application, we address the generation of diphthongs in voice production.