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Localized eigenmodes in a moving frame of reference representing convective instability.[1] KOEN GROOT, Texas A&M University, SEBASTIEN NIESSEN, University of Liege — When representing convective instability mechanisms with the streamwise BiGlobal stability approach, results suffer from a sensitivity to the streamwise domain truncation length and boundary conditions. The presently proposed methodology resolves this sensitivity by considering a moving frame of reference. In that frame, the spectrum features discrete eigenvalues whose corresponding eigenfunctions decay exponentially in both the up- and downstream directions. Therefore, the truncation boundaries can be placed far enough that both variations in the domain length and artificial boundary conditions have no impact. The discrete nature of the spectrum enables the use of (non-)local stability methods to perform an independent approximation of the BiGlobal eigenvalues via global mode theory. We demonstrate that retrieving set-up-independent solutions in the stationary frame of reference is likely impossible for the flow case considered.

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Koen Groot
Texas A&M University

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