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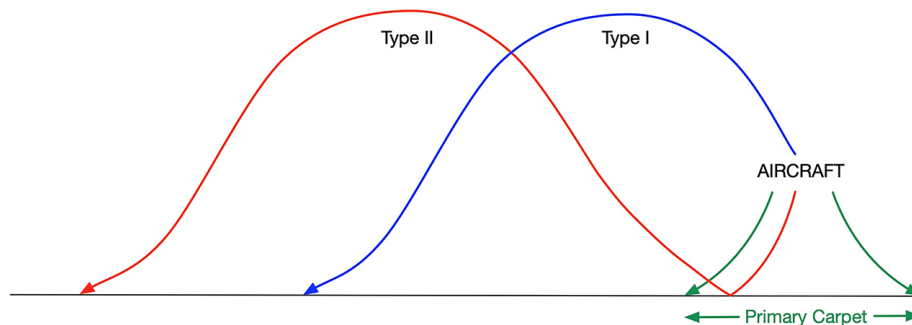


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Simulations predict secondary sonic booms along American coastlines

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When atmospheric conditions are just right, sonic booms from speeding aircraft can be heard. A new study investigates when those conditions are most likely.



In the future, commercial transoceanic flights could be supersonic. While this would speed up intercontinental travel, it could also subject coastal communities to extra noise from supersonic booms.

Riegel and Sparrow explored the impact supersonic air travel might have on coastal communities. Their work focused on secondary sonic booms, which occur when certain atmospheric conditions cause a sonic boom to be refracted down from the stratosphere to create a subsequent, secondary boom.

Using a NASA software program called PCBoom to predict the locations of sonic booms, Riegel and Sparrow simulated different times of the year and intercontinental flight paths to understand where secondary sonic booms might be heard on the ground in the United States. They looked at how seasonal atmospheric changes might affect noise propagation.

The results showed secondary sonic booms would be most commonly heard on the east coast during the summer months and on the west coast in the winter. This closely matches previous findings and coastal community experiences on secondary sonic boom locations.

“We are very excited that our results show consistent predictions for us to reliably identify when the coastlines would be at risk for impacts from secondary sonic booms,” said author Kimberly Riegel. “This kind of prediction allows the Federal Aviation Administration to make informed decisions about limitations on flight trajectories that may be required.”

The researchers note there is still work that needs to be done to fully understand the impact supersonic transoceanic flights might have. They plan to expand their predictions to other areas and types of aircraft and investigate the possibility for supersonic flights over land with quieter aircraft.

Source: “Secondary sonic boom predictions for U.S. coastlines,” by Kimberly A. Riegel and Victor W. Sparrow, *Journal of the Acoustical Society of America* (2022). The article can be accessed at <https://doi.org/10.1121/10.0014860>.

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