

Post-doctoral position

Human perception of the low sonic boom

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Context:

It is clear that older generation supersonic airplanes (like Concorde) are not be currently allowed to fly over land at supersonic speeds. What about the next generation planes being developed, for which the theory predicts a lower-level sonic boom?

While NASA has been working on this question for many years, it is necessary that other independent studies, in different conditions, are conducted in order to support new regulations. This is one of the goals of the H2020 collaborative project RUMBLE (RegUlation and norM for low sonic Boom LEvels), dedicated to the production of scientific evidence as requested by national, European, and international regulation authorities to determine the acceptable level of sonic booms over land and the appropriate ways to comply with it (<https://rumble-project.eu>).

Objective:

Study human perception of low level sonic booms in natural and realistic conditions.

Tasks:

Various experiments need to be designed to study the influence of low-level sonic booms on daily life. Different conditions will be considered:

- Participants involved in social interactions (lunch with friends, listening to radio, talking on the phone, ...)
- Participants involved in cognitive tasks (problem to solve, counting backwards, ...)
- Participants involved in manual tasks requiring precision (drawing a horizontal line between two lines, without touching them, screwing nuts on tiny screws, ...)

The post-doctorate researcher will thus have to propose controlled protocols allowing measurement of the low-level sonic boom influence on the performance of tasks which are relevant to daily tasks. This influence will need to be measured quantitatively (error rate, speed, accuracy, ...) and qualitatively (via questionnaires).

The post-doctorate researcher will also be responsible for recruiting participants, conducting the experiments, and analysing the data.

The experiments will be conducted in a private house on the St Cyr campus, in which a low-level sonic boom simulator, currently being developed at the Institut d'Alembert, will be installed. The engineer who conceives it, Léo Cretagne, will be in charge to assist its operation at the desired levels during the experiment. Other contexts of ambient noise level can be considered too, thanks to the possibility of playing daily life sounds (hoover, television, neighbour conversations, ...) in other rooms of the house.

The post-doctorate researcher will be expected to take part in discussions with the other partners within the work package so that this study falls within the global framework and unified (when possible) methods and questions are used. For instance, Steven van de Par and Stephan Töpken (Department of Medical Physics and Acoustics, Oldenburg Universität) are interested in low-level sonic boom perception in a small, artificial, and very controlled venue. Uwe Müller (German Aerospace Center DLR / Institute of Aerospace Medicine / Sleep and Human Factors Research), are investigating the low-level sonic boom effect on sleep.

Practical informations:

Gross salary: 2600 to 3000 € per month, depending on the experience level

Address : Institut d'Alembert, Sorbonne Université, Paris and Saint Cyr l'Ecole

Duration : 18 months

Application:

Solid competences in experimental psychology and an interest in acoustics and sound perception are required.

Applicants are invited to send a detailed CV and cover letter to claudia.fritz@upmc.fr.