

ANALYSING MIXING PROCESSES IN TOMOGRAPHICALLY IMAGED FILAMENTS OF ASIAN MONSOON OUTFLOW DURING THE PHILEAS CAMPAIGN USING COMPUTER VISION



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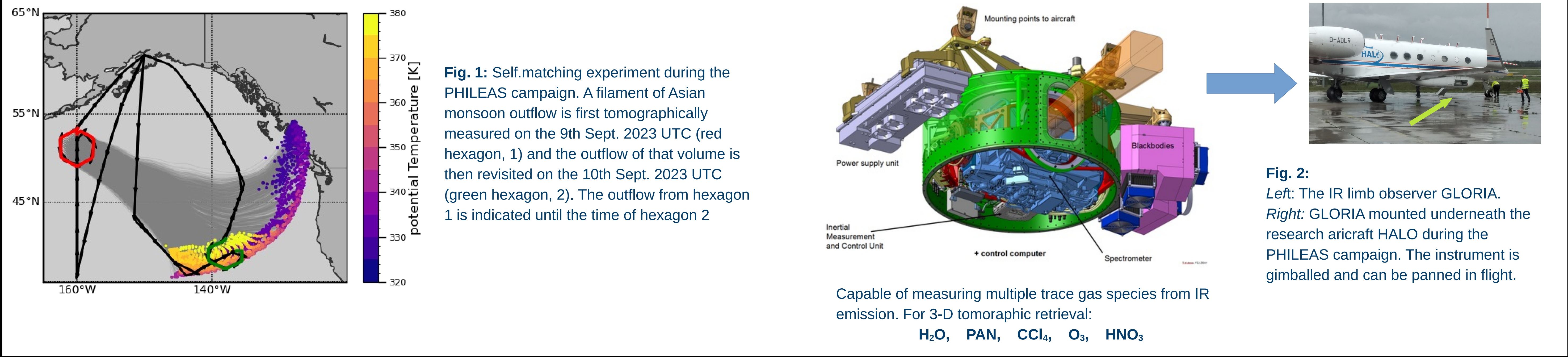
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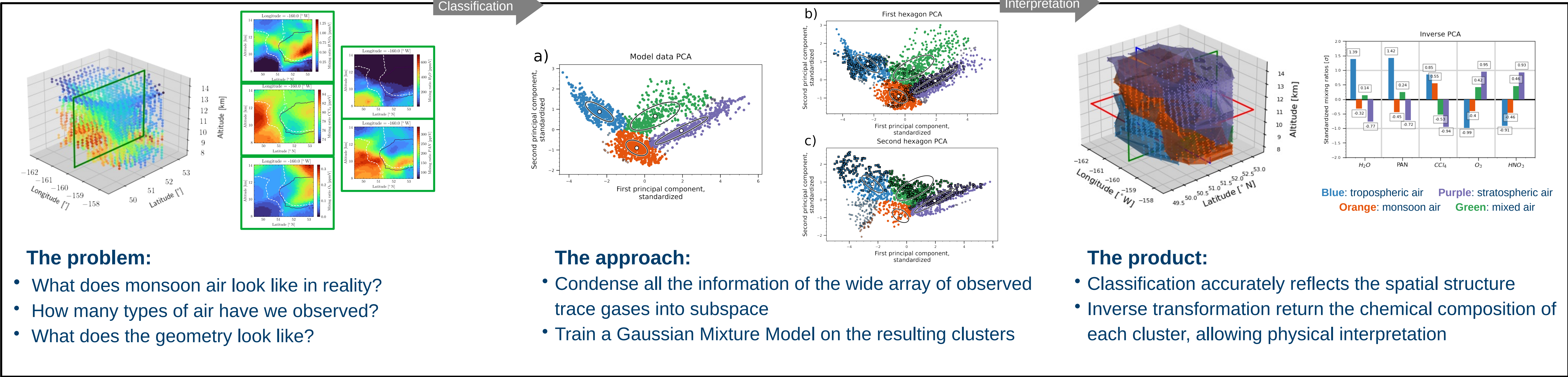
Abstract: Mixing of air masses in the atmosphere is a fundamental contribution to the global circulation. However, mixing processes are difficult to measure, as they require consecutive measurements of the same air masses at different times. The PHILEAS campaign in September 2023 aimed at studying the transport pathways of Asian monsoon air into the UTLS. In a self-matching experiment air masses from the Asian summer monsoon are 3-D tomographically imaged on two consecutive days by our airborne GLORIA instrument across multiple trace gas species. We present a novel computer vision approach, which allows us to classify each type of measured air mass and consequently reveal the mixing processes. This matching experiment was conducted as a demonstration for the Earth Explorer 11 candidate CAIRT, a satellite instrument with a similar measurement principle and capabilities.



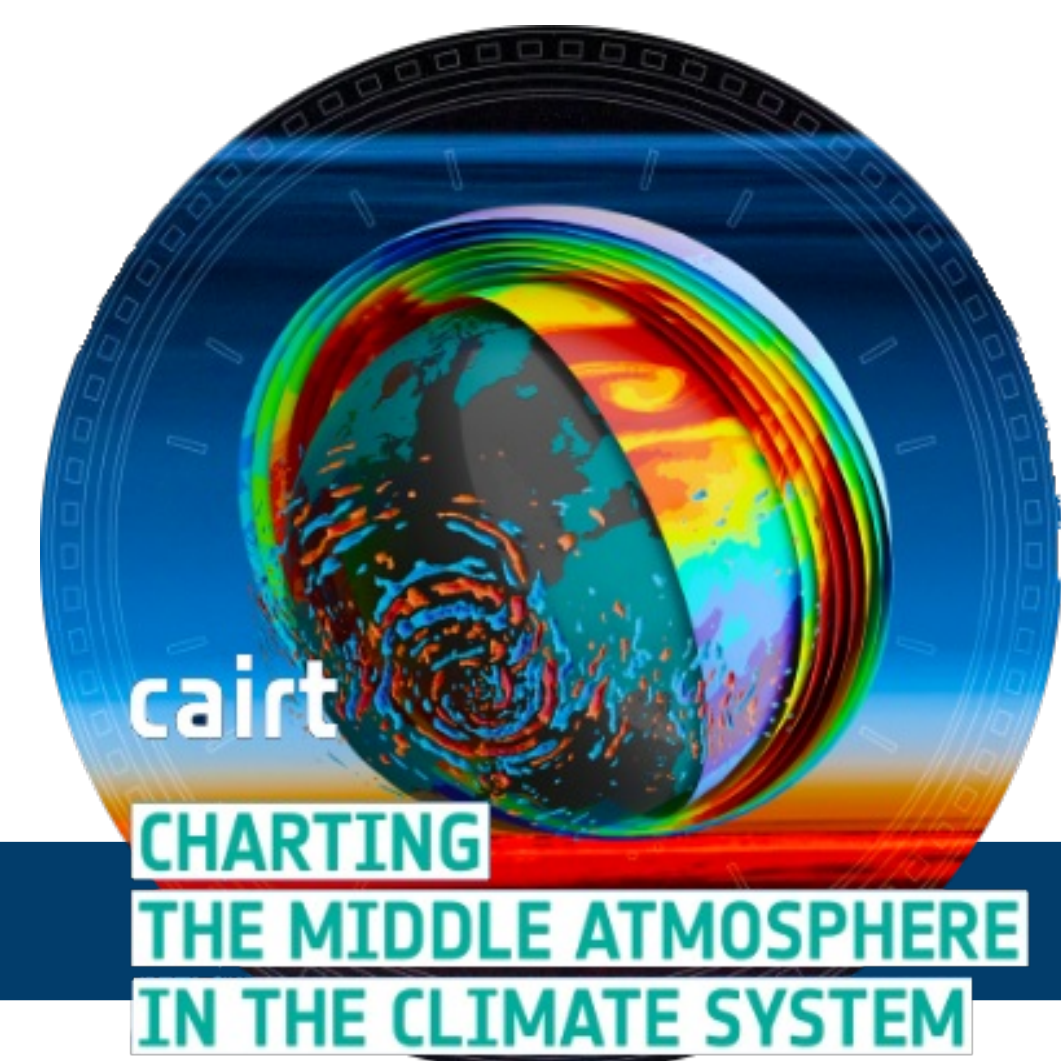
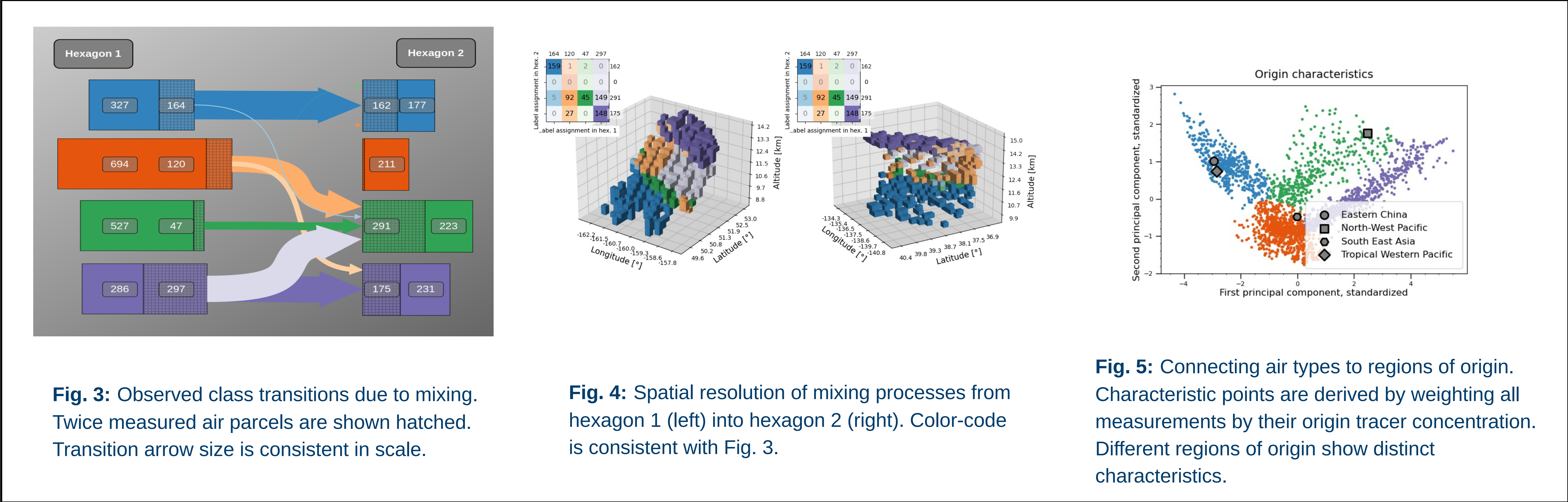
◆ The self-matching experiment:



◆ Classifying air types via Computer Vision:



◆ Main results from this analysis:



The GLORIA instrument is the demonstrator for the ESA Earth Explorer 11 candidate CAIRT. It would be capable to perform similar 3-D tomographic measurements of the same trace gas species over a much larger altitude range and with global coverage, among many more capabilities. Find out all about CAIRT here:



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