The Alpha Jet Atmospheric EXperiment (AJAX): Past, Present, and Future Airborne Measurements

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The Alpha Jet Atmospheric eXperiment (AJAX) has been flying a scientific payload since January 2011 measuring ozone, carbon dioxide, methane, formaldehyde and meteorological parameters up to nine km. AJAX is located and operated from the San Francisco Bay Area and has flown a total of 229 flights, on a regular basis (approx. three per month) over all seasons cataloguing a long-term record of trace gas concentrations over California and Nevada. The AJAX project focuses on science questions which benefit from routine, frequent observations with flexible scheduling including:

- Long-range transport (LRT) and Stratosphere-to-Troposphere Transport (STT). Regular sampling by AJAX has aided identification of LRT and evidence of STT, which during spring and summer months are visible as elevated ozone laminae within airborne profiles. Some laminae have the ability to impact surface-level air quality.

- Satellite validation. Regular AJAX missions include flights to Railroad Valley, NV in coordination with GOSAT and OCO-2 observations, and more recently to provide coincident measurements under the TROPOspheric Monitoring Instrument (TROPOMI).

- Wildfires. The AJAX project is uniquely flexible to incorporate specialized flights with limited planning notice, such as sampling emissions from California wildfires. Twelve wildfires have been sampled, some more than once, allowing observation of emission changes as the fire progresses.

After a year of aircraft down time, we are planning for the future with AJAX 2.0, including a new aircraft and additional measurement capabilities.

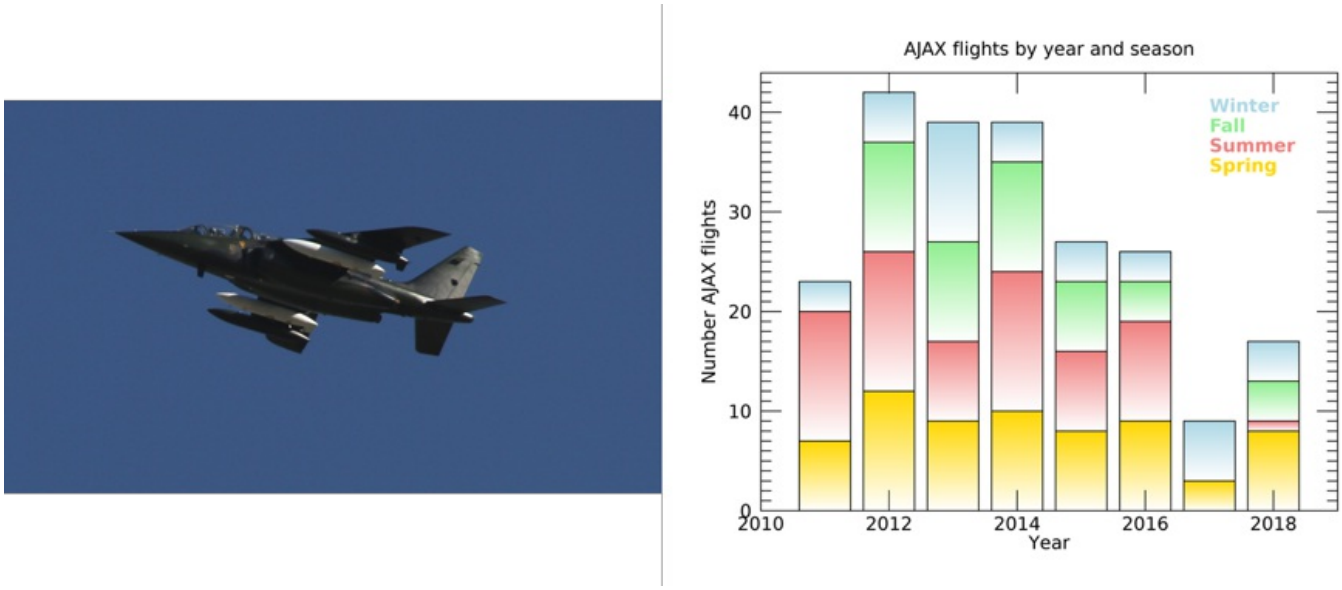

Figure 1. AJAX in-flight (left) and the number of AJAX flights by year and season (right).