EUREC4A: First Impressions

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The EUREC4A field campaign took place during January and February 2020, in the lower trades of the northern tropical Atlantic, over and in the seas windward of Barbados. The initial purpose of the campaign was to test hypothesized cloud responses underpinning large positive radiative feedbacks from the desiccation of marine shallow convection with warming. To do so EUREC4A built on a long-standing cooperation with the Caribbean Institute for Meteorology and Hydrology to collect long-term cloud observations. Its scope was subsequently expanded by the addition of many partners, with funding from a variety of additional EU and UK projects, and US participants through ATOMIC, to address many additional questions. These ranged from the role of fine-scale eddies and fronts on air-sea coupling, to the effects of meso-scale organization on cloud radiative effects, to the strength of aerosol cloud interactions, among others. Hundreds of scientists from nearly a dozen nations -- incorporating measurements from four large Research Vessels and five Research Aircraft, an advanced remote sensing ground station and a large number of autonomous vehicles in the air and sea -- combined their expertise to develop an unusually comprehensive picture of the processes relevant to the lower atmosphere and the upper ocean in the lower trades. We share our first impressions from EUREC4A, its surprises, and its prospects for answering some of the riddles that motivated this tremendous and coordinated effort.