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Dynamics of Dissociative Electron Attachment to CO_2 Investigated By 3D Momentum Measurements[1] DANIEL SLAUGHTER, HIDEHITO ADANIYA, ALI BELKACEM, Lawrence Lawrence Berkeley National Laboratory, Chemical Sciences, Berkeley, California USA — Dissociation of a stable molecule by low-energy electrons via a resonant temporary negative ion species, in the dissociative electron attachment (DEA) process, plays an important role in natural phenomena such as atmospheric and interstellar chemistry and radiation damage in biological systems by low-energy secondary electrons. DEA has also been suggested as a new tool to control chemical reactions through enhancement of specific dissociation pathways. We present fully-differential cross sections for dissociative electron attachment to CO_2 measured using a 4π momentum spectrometer. The range of electron energies of these measurements span three DEA resonances, leading to dissociation of O^-, from 3 to 15 eV. While the resonant states involved in each of these processes for CO_2 have long been considered to be accurately identified from several early measurements of the DEA energy dependence and kinetic energy release, we find interesting dynamics that shed new light on this fundamental system.

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