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Photodouble ionization of the water molecule: equal and unequal energy sharing of the excess enregy JUAN RANDAZZO, Centro Atmico Bariloche and CONICET, GIORGIO TURRI, Embry-Riddle Aeronautical University, Phys. Sciences Dept. Daytona Beach, FL, USA, PAOLA BOLOGNESI, CNR-Istituto di Struttura della Materia, CP10,00015 Monterotondo Scalo, Italy, JOHN MATHIS, Embry-Riddle Aeronautical University, Phys. Sciences Dept. Daytona Beach, FL, USA, LORENZO UGO ANCARANI, Universit de Lorraine, CNRS, LPCT, F-57000 Metz, France, LORENZO AVALDI, CNR-Istituto di Struttura della Materia, CP10,00015 Monterotondo Scalo, Italy — We study experimentally and theoretically the photo double ionization of the water molecule. Two sets of triple differential cross section (TDCS) are reported: at 20 eV above threshold under an equal energy sharing regime, and at 32 eV above threshold and unequal energy sharing. In both cases, we have considered three different emission angles (0, 30 and 60 degrees). According to the spectroscopy of the water dication states and the overall experimental energy resolution, several molecular states may contribute. The measurements are compared with a theoretical calculation in which the ten-electron molecule is reduced to a two-electron system, and finally a partial wave set of driven equations is solved by means of the Generalized Sturmian Method. The average over all possible molecular orientations is performed analytically. The measured and calculated cross sections present rich multilobe angular distributions which somehow reflect the complex dynamics of the electron pair. Considering the theoretical approximations, the experiment-theory comparison is pretty good

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