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Fluorescence measurements from x-ray irradiated liquid water

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The investigation of the decay dynamics of liquids and solutions after x-ray irradiation became accessible in recent years owing to the tremendous progress in liquid microjet techniques. This method meets the high vacuum conditions required for experiments using x-ray excitation at synchrotron radiation facilities. Mainly via electron spectroscopy, several non-local de-excitation processes and intermolecular interaction mechanisms were identified. Their role in radiation biology is currently lively discussed. However, the detection of charged particles as a probe for decay mechanisms is constrained due to their short escape length in dense media. We present a complementary experimental method in which fluorescence detection is used to investigate reaction products after excitation of liquid microjets with synchrotron radiation. This approach is especially beneficial to track neutral and long-living species.

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