PHOTOFRAGMENT IMAGE PROCESSING VIA PATTERN RECOGNITION

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A computer program is presented that identifies the number and position (energy) of photodissociation / ionisation channels on velocity-map images by recognising geometric primitives on the "raw" image. A priori knowledge about the image centre, size, or distortions of circularity is not required. The speed and objectivity of analysis are increased by eliminating human intervention on those stages of processing. The presented algorithm is derived from the Hough Transform and is highly robust with respect to uneven distribution of intensity, background signals and realistic distortions of circularity. Knowing the number and position of the channels makes further processing (reconstruction of the 3D distribution of particle velocities) straightforward and computationally efficient.