Latest results with the KWISP force sensor at CAST

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The KWISP opto-mechanical force sensor has started searching for solar chameleons through their direct coupling to matter. Its sensing element, a 100 nm thick Si3N4 membrane, was mounted in the focal plane of the CAST X-ray telescope, which focuses also chameleons, and several solar runs were completed using the key sun-tracking capability of the CAST magnet. KWISP is designed to detect, with optical techniques, extremely tiny membrane displacements due to the force exerted by chamelons recflecting off it. The measurement is made possible by a specially devised chamelon beam chopper providing an amplitude modulation, which is instrumental for detection. The KWISP particle sensing technique is presently unique in astroparticle physics. We will present the KWISP setup, discuss its status and results, and focus on upcoming developments.

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