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Development of the ion mass spectrometer for the Comet Interceptor mission

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Comets are pristine small bodies and thus provide key information about the solar system's evolution. Remote observations by ground observatories have characterized various comets, while in-situ observations by spacecraft have brought much more detailed information on several comets. However, the direct observations by spacecraft fly-by or rendezvous have been limited to the short-period comets, which neared the sun many times in the past and thus lost some of (or even most of) their primitive characteristics. The Comet Interceptor mission, led by ESA, aims at a long-period comet or an interstellar object. JAXA will provide an ultra-small (35 kg) daughter spacecraft (probe B1), whose closest approach will be less than 1,000 km, allowing the first-ever multi-spacecraft fly-by observations of a comet. Here we report our recent progress on the development of the ion mass spectrometer onboard probe B1. After the verification of the performance and endurance, we delivered the engineering model to the B1 system for further tests in the assembled state. The design of the flight model is ongoing in parallel.