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CZECH AMBITIOUS MISSIONS COVERING HIGH DEMANDS OF TODAY'S EARTH OBSERVATIONS AND ASTROPHYSICS

Abstract

Czech Ambitious Missions (CAM) – the AMBIC mission the QUVIK mission – are a response to the call of the Ministry of Transport for ambitious projects aiming to shape and improve the Czech space industry and academia. Both of these missions are drivers for the development of the Czech Advanced Platform – a scalable spacecraft platform targeting small satellites equipped by the arcsecond precision AOCS, up to 100W power for payloads, and an active orbit control (including the possibility of de-orbiting). Platform provides wide range of applications from Earth observations and telecommunication up to high-stability scientific observations of the astrophysical phenomena. These small satellite spacecrafts (AMBIC and QUVIK) with a weight of approximately up to 250 kg and a lifetime of a minimum of 3 years, will be launched to the low earth orbit in 2030s.

In this talk, I will focus on the QUVIK mission - Quick Ultra-Violet Kilonova surveyor - whose primary objective is an observation of the evolution of the ultraviolet (UV) brightness of kilonovae, which result from mergers of two neutron stars or a neutron star and a black hole. These mergers cause gravitational waves, which can be detected with observatories such as LIGO/ Virgo/KAGRA. In order to understand their nature and their explosion scenarios, the information about their UV brightness shortly after the explosion is still needed. This missing link shall be provided by QUVIK, which aims to obtain the follow-up observations of kilonovae in UV very shortly (within 20 minutes) after their discovery with gravitational wave observatories. This then drives the development of a real-time alert communication system with the moderately fast re-pointing capability of the whole spacecraft.

CAM missions, supported by the Ministry of Transport of the Czech Republic and supervised by ESA, successfully finished phase B1 and were selected for the implementation phase. The kick-off of the B2 phase is expected in the second half of 2025.