MilSpace2

Spectrum monitoring dual satellite system

The MilSpace2 satellite system will demonstrate the military use of a microsatellite spectrum monitoring system. The mission will build on experience from the Norwegian NorSat-3 and the Dutch BRIK-II missions.

The "Strategic Mutual Assistance in Research and Technology" (SMART) Military Use of Space (MilSpace) Science & Technology cooperation is a bilateral agreement between the MoD of the Kingdom of the Netherlands and the MoD of the Kingdom of Norway. The project team, acting on behalf of the MoDs, consists of FFI from Norway and NLR and TNO from the Netherlands. This consortium forms a bilateral project to develop an innovative dual satellite concept that will detect, classify, and accurately geolocate radars of interest including navigation radars used on ships.

TDoA and AoA

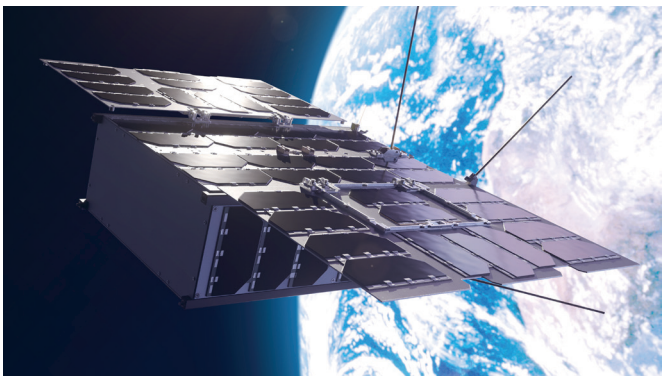
The mission will provide a non-cooperative and all weather capability for detecting radars of interest. The two nanosatellites, Birkeland and Huygens, will both be able to measure angle of arrival (AoA), and will provide improved geolocation accuracy through time difference of arrival (TDoA) when operating in tandem. This is the first known concept that will offer combined AoA and TDoA for a two satellite system. Each satellite will be 6U, where 1U equals 10 cm x 10 cm x 10 cm. The mass of each satellite will be around 10 kg. The two satellites are scheduled for launch in the second quarter of 2022.

Tandem and formation flying

This is the first time Norway and the Netherlands launch a constellation of satellites that will fly in tandem, meaning experience with formation flying will be gained through the project. The two satellites will be placed into a polar Low Earth Orbit (LEO) with an altitude range of 450 to 600 km. They will be positioned in the same orbital plane and the separation distance will vary throughout the mission. Simultaneous detection of pulsed radio frequency emissions by both satellites enables improved geolocation through combined AOA and TDOA geolocation techniques.

Coverage

For a polar LEO orbit of 600 km altitude, the payload antenna footprint will be able to cover any point on the Earth's surface at least four times per day. There will be a higher number of possible observations for higher latitudes. There may be as many as 15 daily observations of areas at higher latitudes.



Illustrasjons: Nanoavionics

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