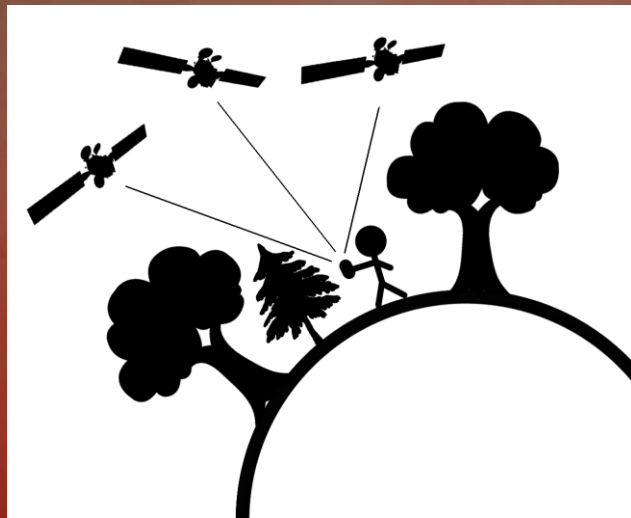


# The use of GNSS signals for the purpose of locating and monitoring the state of vegetation in a forest environment (VEGA 1/0568/23)



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# Motivation



Can GNSS signal quality changes correlate with vegetation changes (grow and fall down leaves, phenology)?

Determination of the position is secondary. More important are parameters like C/N0, multipath, cycle-slips...

Empahsis on low-cost

# Hardware

## Basic parts

- Receiver: simpleRTK3B Pro - chip Septentrio mosaics-X5
- 3 frequency calibrated antenna + L-band (AS-ANT3B-CAL-01)
- single-board computer Raspberry Pi 4B
- on rover side also fish-eye time camera

## mosaic-X5

### FEATURES

#### GNSS technology

448 hardware channels for simultaneous tracking of all visible supported satellite signals<sup>1</sup>:

- ▶ GPS: L1C/A, L1PY, L2C, L2P, L5
- ▶ GLONASS: L1CA, L2CA, L2P, L3 CDMA
- ▶ Beidou: B1I, B1C, B2a, B2b, B2I, B3
- ▶ Galileo: E1, E5a, E5b, E5 AltBoc, E6
- ▶ QZSS: L1C/A, L1 C/B, L2C, L5
- ▶ Navic: L5
- ▶ SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ On module L-band

# Hardware

## Installation

### Rover

- same type as base station
- data for correlation determination including pics from fish eye camera



### Base station

- for data calibration,
- reference data - also for different projects (SKPOS monitoring station), NTRIP caster (?)



# Rover placement and vegetation changes



# Rover placement and vegetation changes



# Rover placement and vegetation changes



# Rover placement and vegetation changes





# Data, software, evaluation

- RINEX and .sbf data in 60 s interval
- Fish-eye pics (9:00, 12:00, 15:00)
- Climate data (?)
  
- G-nut/Anubis, SBF Analyzer, RTKLib
  
- What to focus on? – system, frequency, elevation, NLOS/LOS, climate (humidity, wind...), periode of measurement...

