

OpenSatCom

open-source in satellite communications

Eleftherios Kosmas

elkos@libre.space

Open-Source Cubesat Workshop 2021



Libre Space
Foundation

- ESA activity
- Implemented by Libre Space Foundation & inno3
- Evaluation of Open-Source Models in Satellite Communications
- Identify existing Open-Source projects relevant to satellite communications
- Co-ordinated sub-activities for assessment
- Dissemination through opensatcom.org website

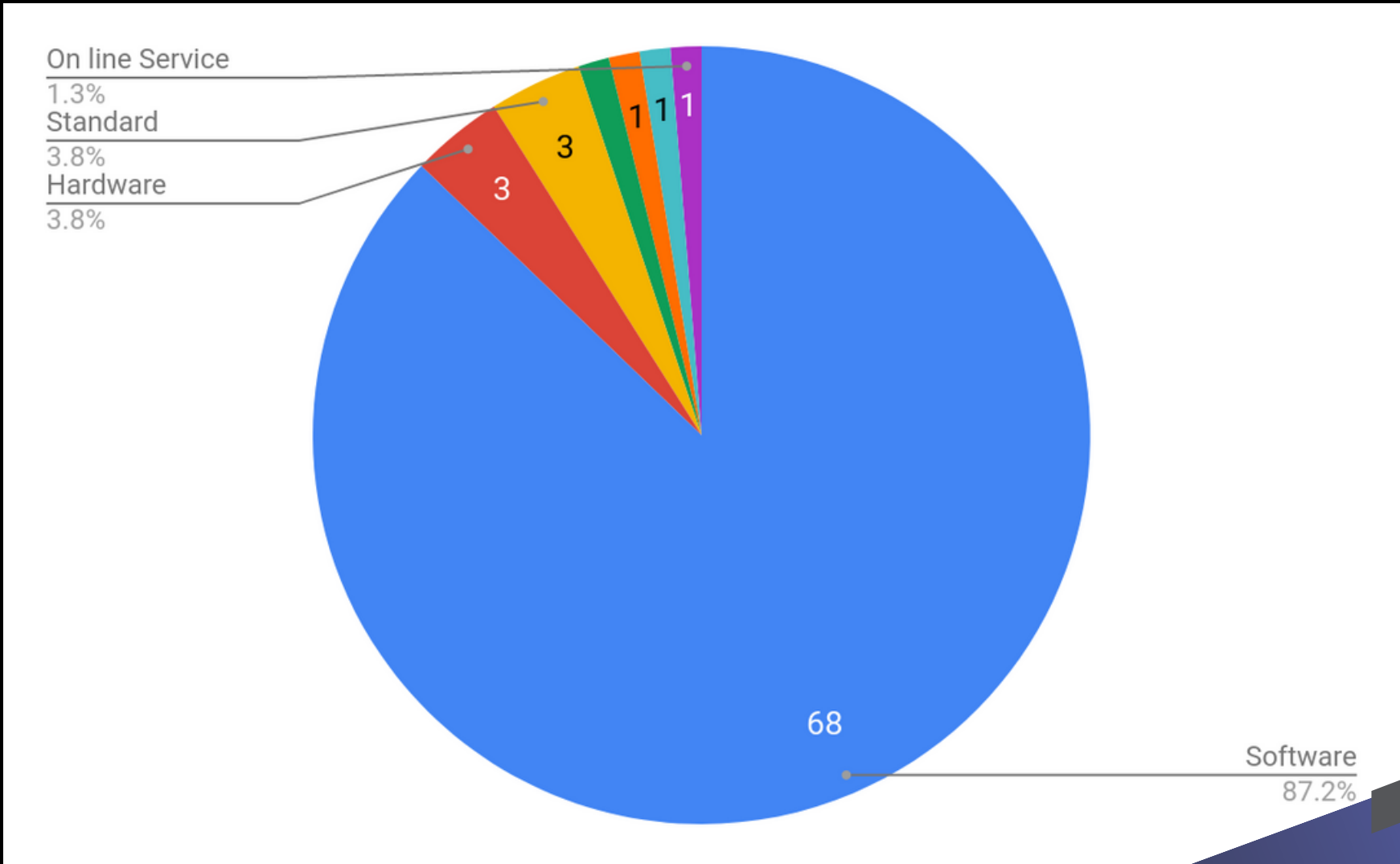
Findings

- Open Source Models include technological development aspects, licensing/legal considerations, revenue and community aspects
- Licenses strongly impact such models
- Open Standards are KEY towards an Open Ecosystems but MUST be coupled with open licenses and appropriate governance
- Open Source is nowadays the basis on many technical stacks

Open Source Business Models

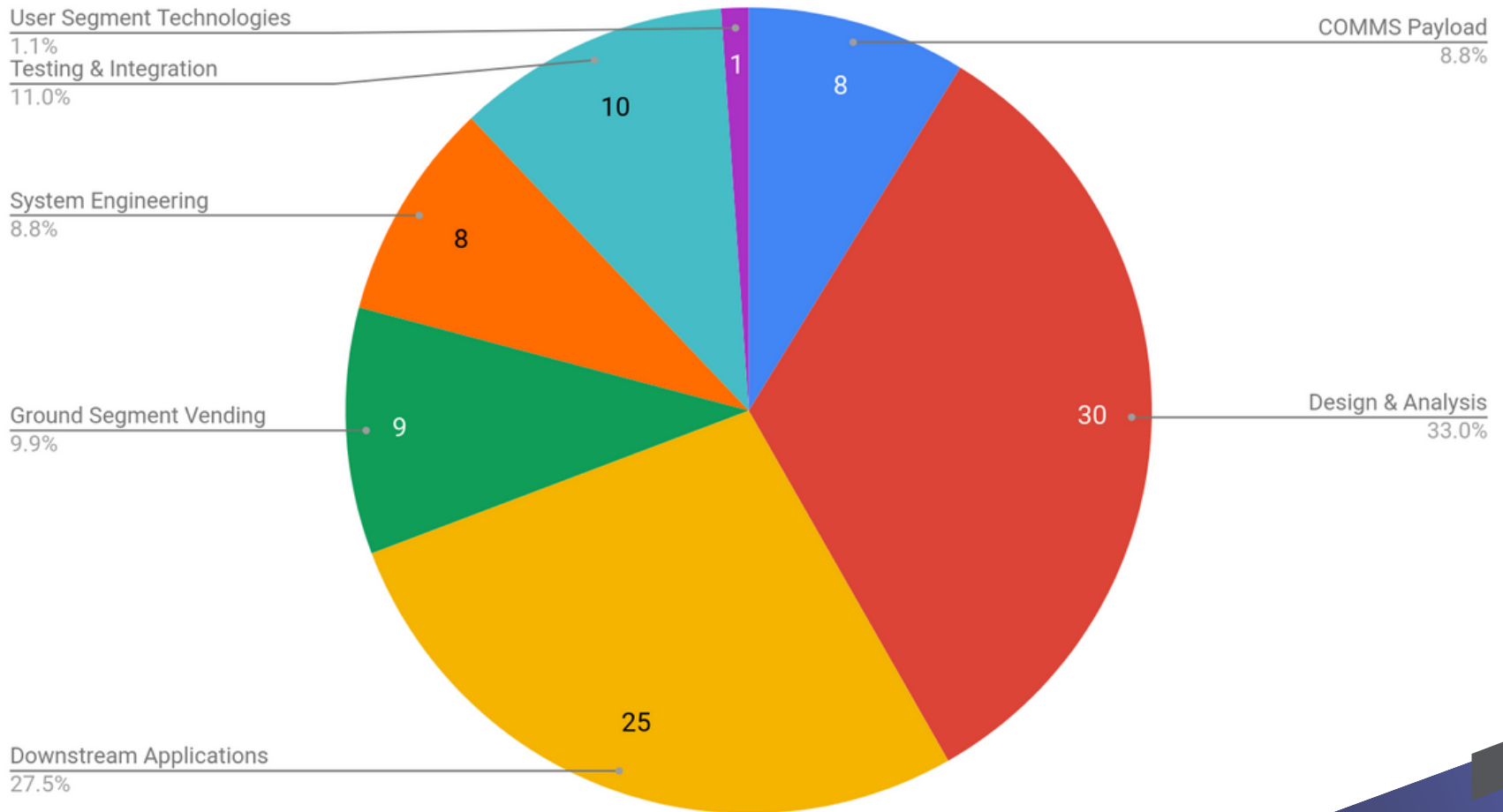
- B2B open-source (Android/Capella)
- Controlled Ecosystem (Wordpress/SatNOGS)
- Common Upstream (OpenSSL/Orekit)
- Ethically open-source (Diaspora/poliastro)
- Open Hardware -Design Focus
(Arduino/HackRF)
- Opportunistic Open Source (core dumps)
- Mass-Market Open Source (Firefox/FreeCAD)

Projects Identified



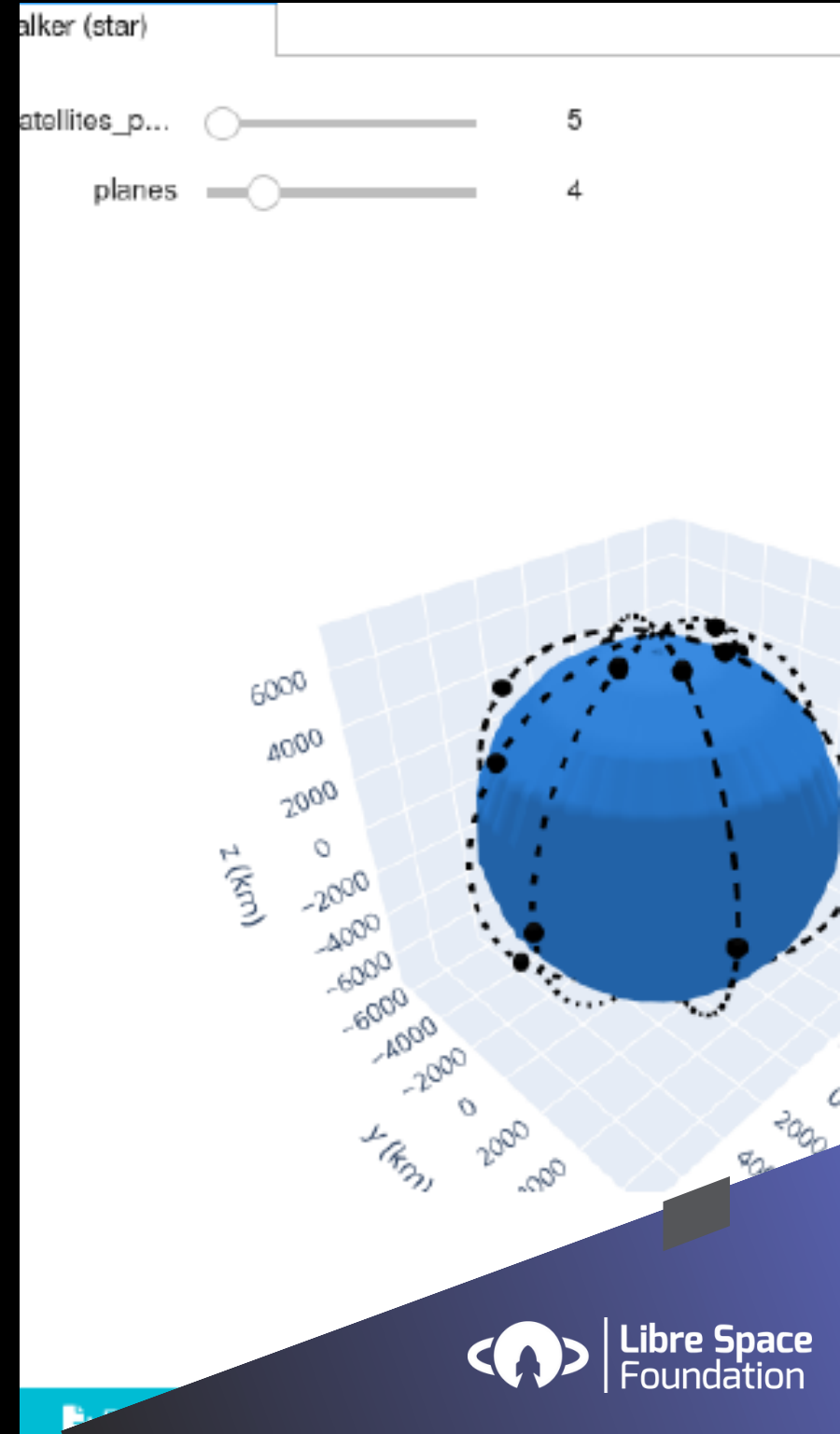
Projects domains

Domains of Projects Identified



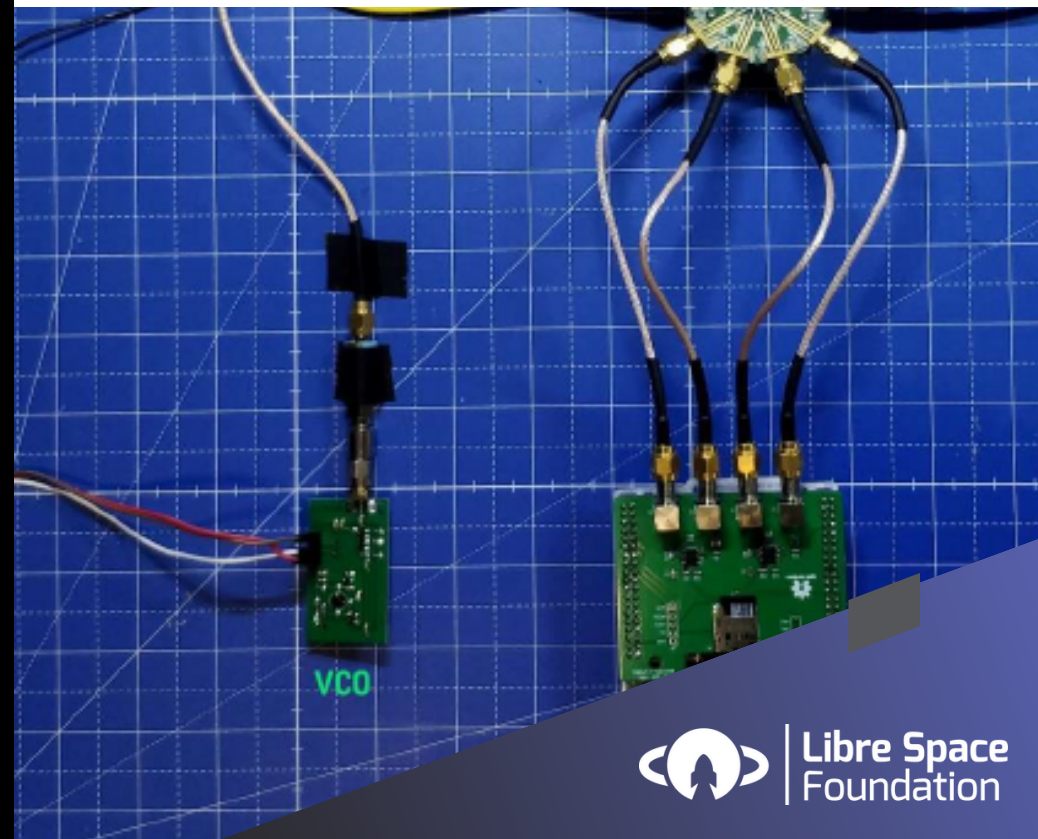
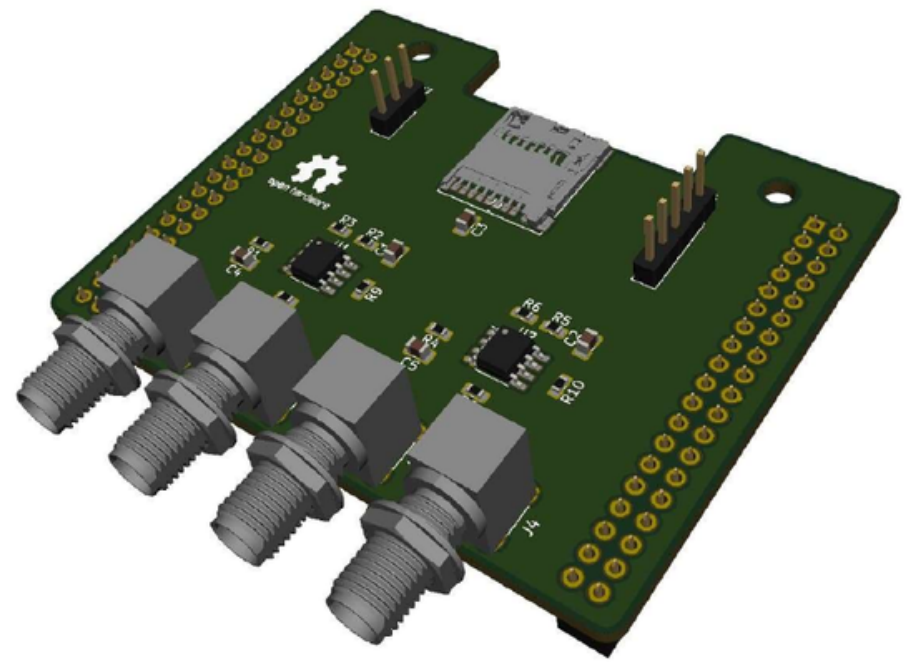
Sub-activities

Astrodynamic software review
and constellation designer



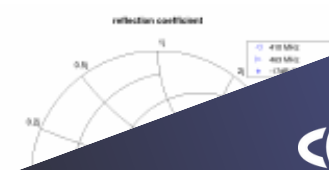
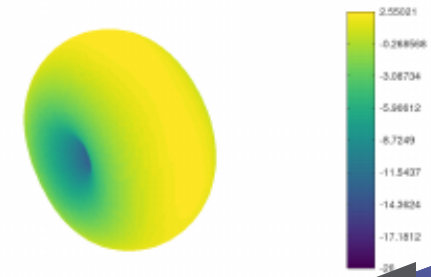
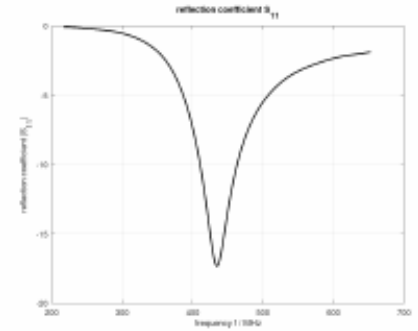
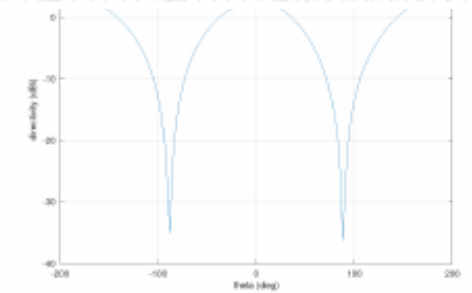
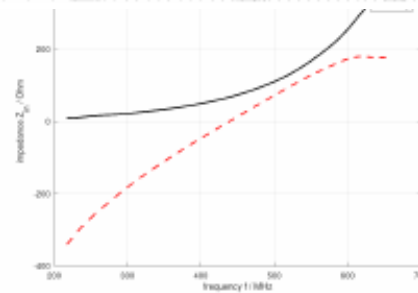
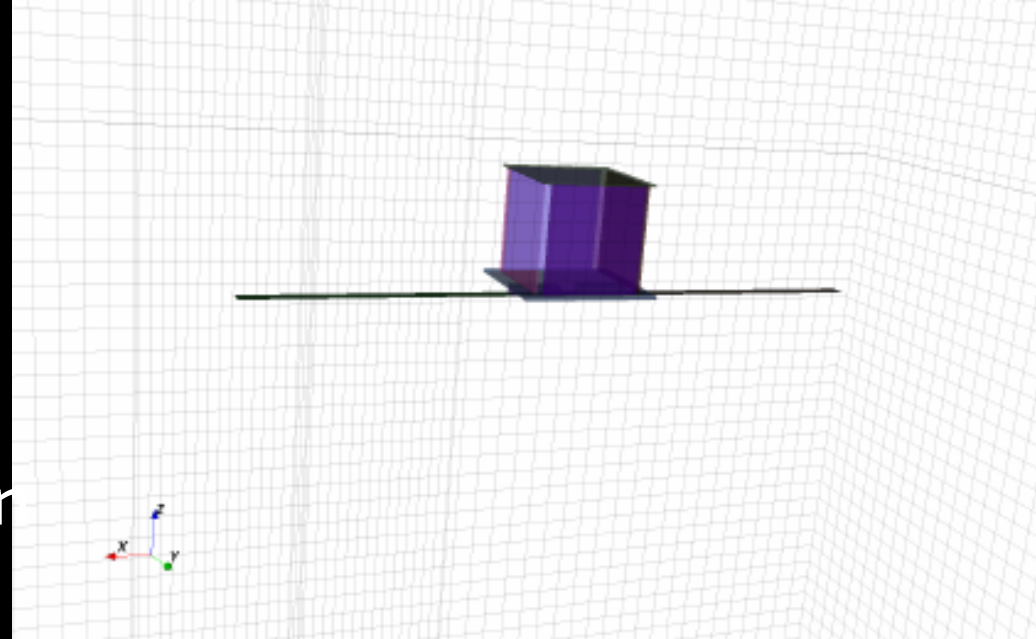
Sub-activities

IQ modulator
using off-the-shelf SoCs
(with embedded DACs)



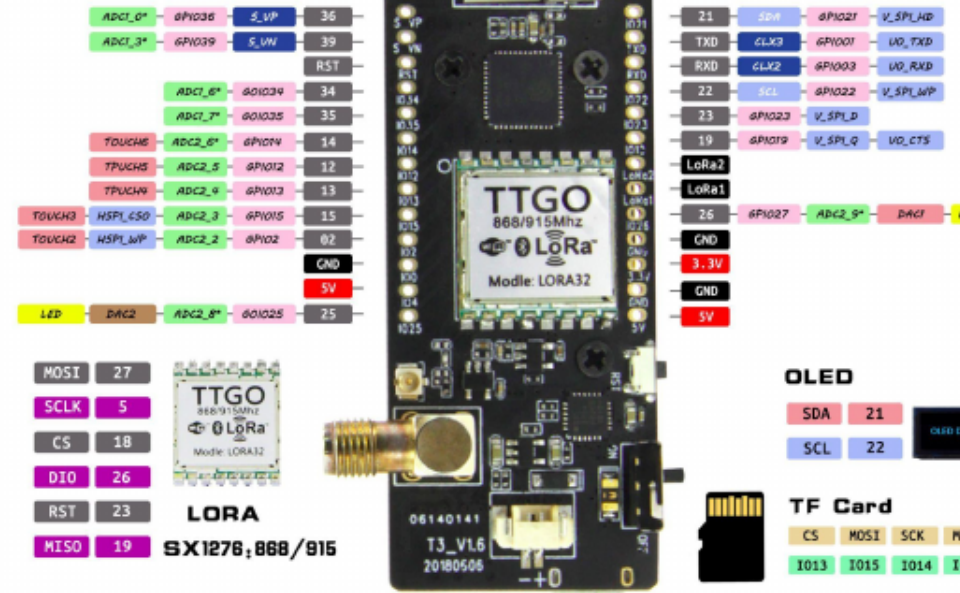
Sub-activities

Export model for EM simulation
in openEMS using FreeCAD



Sub-activities

SatNOGS Tiny



More info

OpenSatCom.org