#GWF2020

GWF

GEOSPATIAL WORLD FORUM

TRANSFORMING ECONOMIES IN 5G ERA

The Geospatial Way!

7-9 April 2020 /// Amsterdam

www.geospatialworldforum.org

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UrtheCast Constellations: World's first fully-integrated Optical and SAR constellations

Fabrizio Pirondini, CEO Deimos Imaging & GM Earth Observation UrtheCast

Geospatial World Forum 2016, Rotterdam, The Netherlands, 25 May 2016

Deimos Imaging, an UrtheCast Company

UrtheCast acquired Deimos Imaging in 2015

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Theia

Iris

Cloud Platform

150 People

deimosimaging

Deimos-1

Deimos-2

Ground Stations

100 People

A Vertically-Integrated EO System

A space-based Geospatial Big Data collection, processing, and information management system — completely vertically-integrated.

Upstream

Satellites

Midstream

UrthePipeline
Ground Segment

Downstream

UrthePlatform

UrtheCast's EO Sensor System, Today

We provide a unique portfolio of EO products, and it's evolving

Deimos-1

Medium-res broad area coverage

Theia

Medium-res still imagery

Iris

High-res video

Deimos-2

High-res still imagery

UrthePlatform

API-based cloud platform

We are already developing our Next Generation

Market-driven progression of sensors and infrastructure, based on three synergistic pillars

Theia

Deimos-1

Iris

Deimos-2

Cloud Platform

In-House Archive

UrtheDaily™ Constellation

OptiSAR™ Constellation

UrthePlatform

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UrtheDaily™: a daily world for GeoAnalytics

The UrtheDaily™ Constellation

BEST COVERAGE

All the World, Everyday, at 10:30 AM, at 5m/pixel, through a user-friendly cloud platform

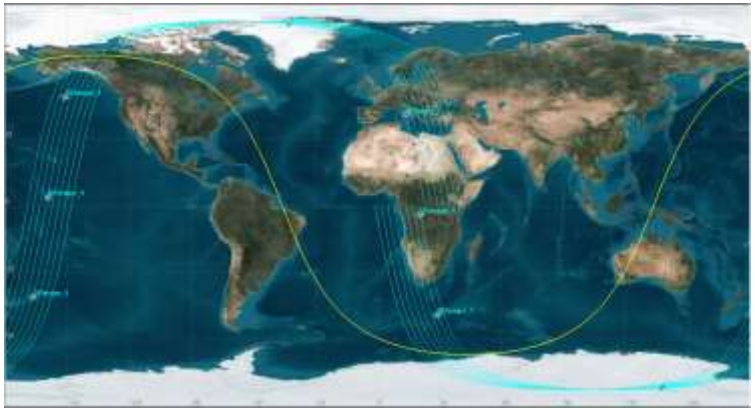
8 satellites to produce consistent, reliable, daily delivery of 140 M km^2 of multispectral imagery

Product: Multispectral, 5m/pixel high-quality imagery, with full global daily coverage
Service: Through the cloud, and via APIs, all based on the UrthePlatform

UrtheDaily™ will enable daily, global change detection and analysis at unprecedented scale.

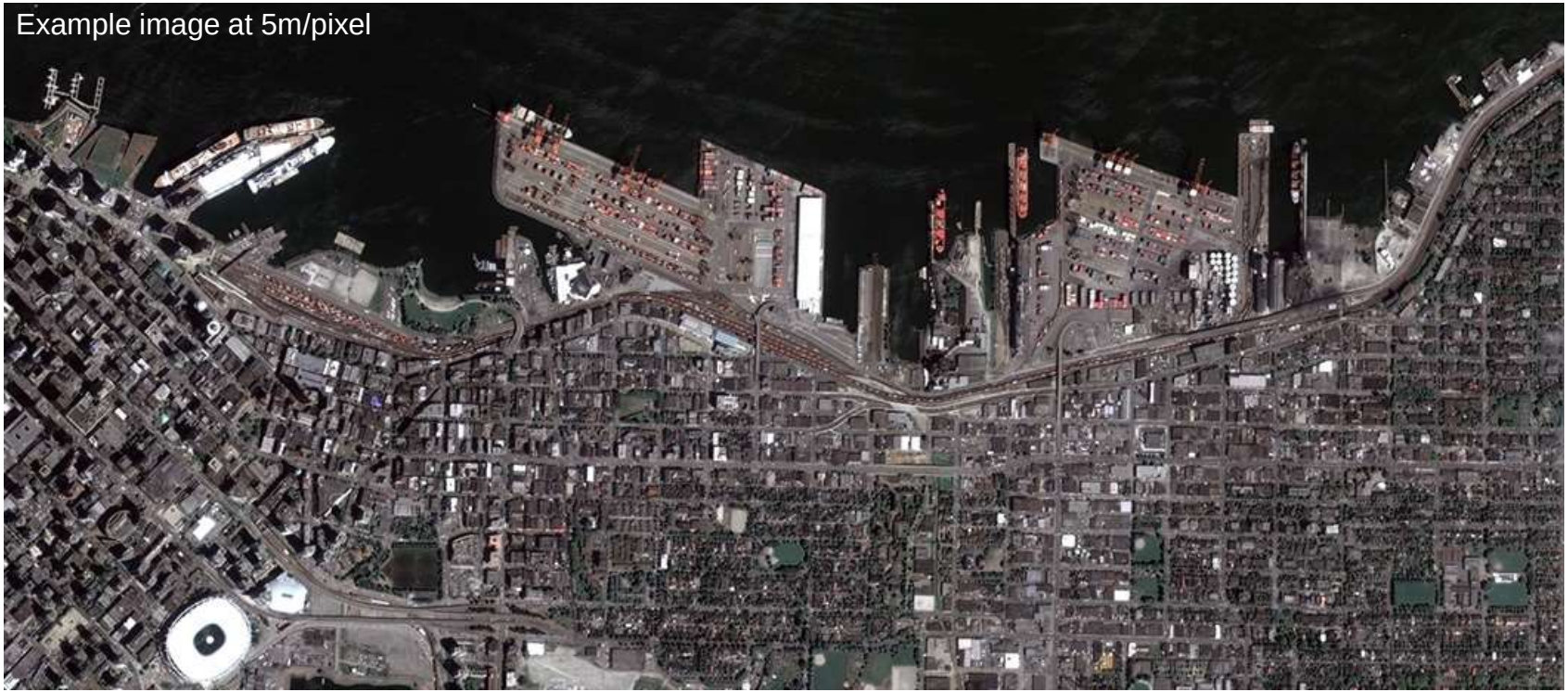
- Developed following years of study, as natural evolution of the Deimos-1 and Theia experiences
- Incorporates market lessons learned via current assets and customers
- **An unprecedented and disruptive product/service, tailored for GeoAnalytics**

UrtheDaily™ operations could start as early as 2018



The UrtheDaily™ Constellation

All the World, Everyday, at 10:30 AM, at 5m/pixel, through a user-friendly cloud platform



UrthePlatform™: Unleashing EO Big Data

Available NOW, with 5 main APIs and data from multiple satellites

UrthePlatform End User Dashboard Welcome Page

UrthePlatform End User Tools – Archive Browser

https://developers.urthecast.com

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OptiSAR™: a closer look, anywhere, any time

The OptiSAR™ Constellation

BEST REVISIT

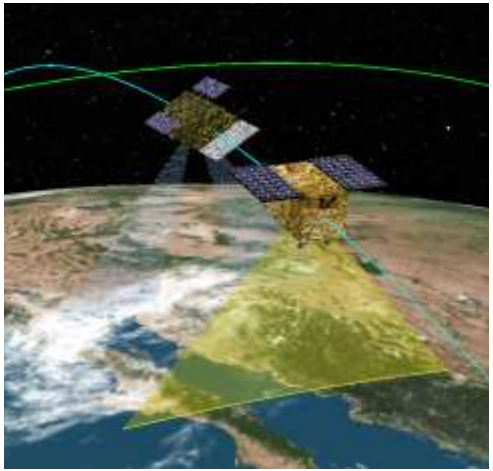
The World's first fully-integrated constellation of Optical and SAR satellites

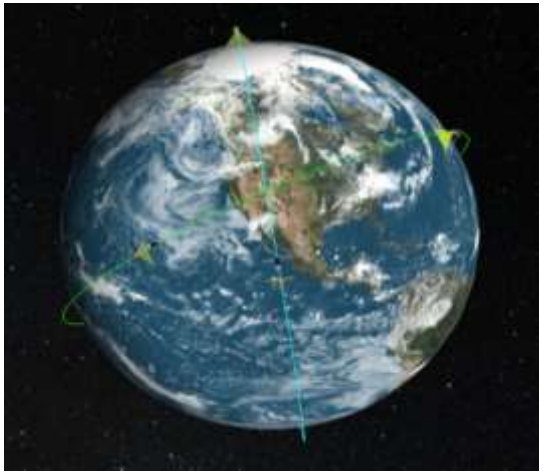
16 Satellites in two orbit planes

Satellites are arranged in 8 pairs:
SAR (X+L bands) + Optical (50 cm)

This arrangement allows for:

- Very high assured (day/night, cloudy or not) revisit worldwide
- Imaging of the same location with SAR and Optical
- Optimized multispectral imaging through cloud avoidance



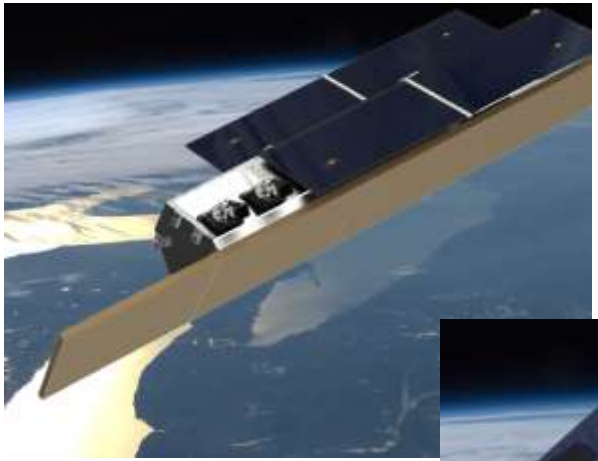


OptiSAR™ operations could start as early as 2020

The OptiSAR™ Constellation: Main Characteristics

OptiSAR – SAR:

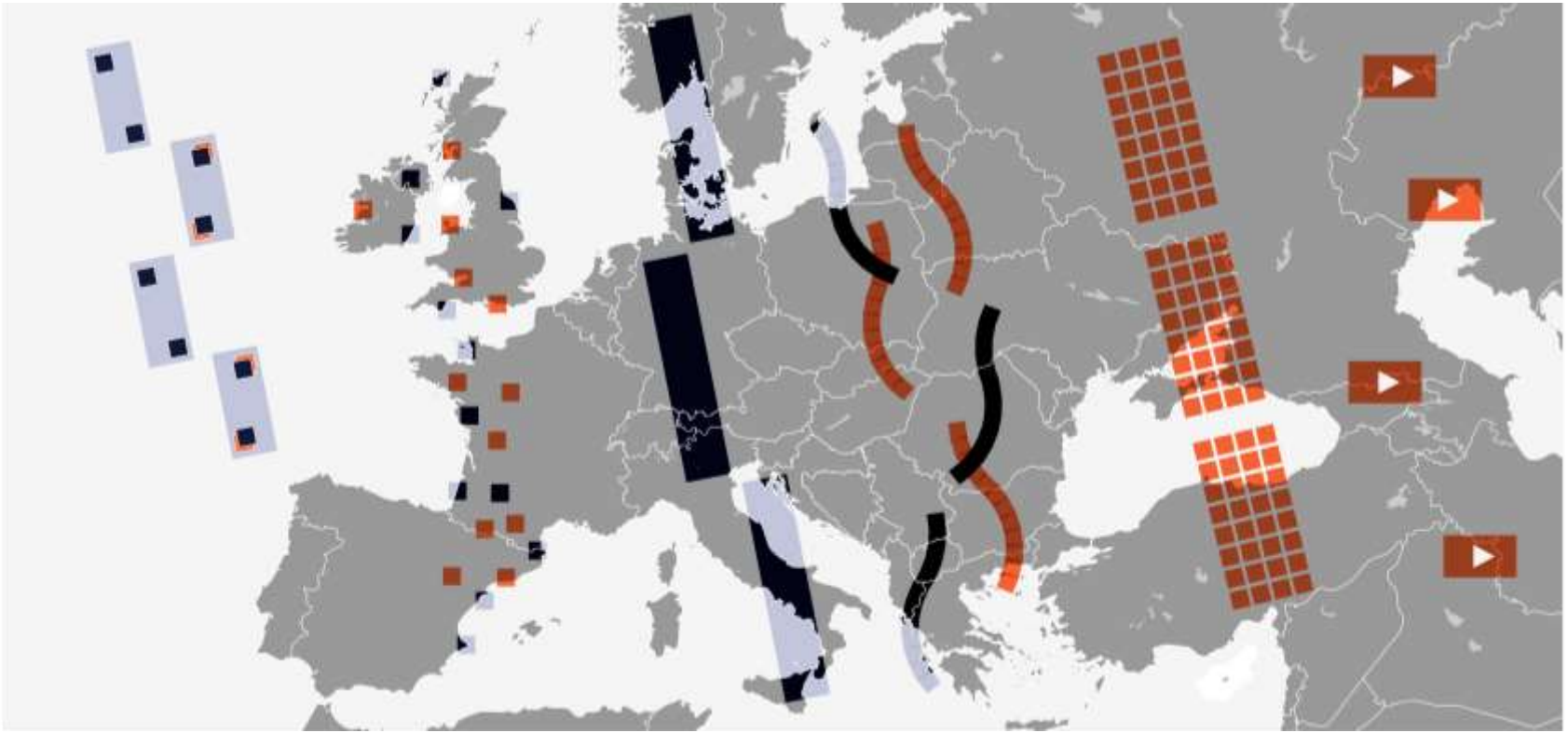
- Mass: 1400 kg
- Simultaneous X and L band imaging
- X-band: 1-m resolution (single-pole)
- L-band: 5-m resolution (quad-pole)
- MetCam for cloud monitoring



OptiSAR – Optical:

- Mass: 700 kg
- Dual imaging: Pushbroom + Video
- Pushbroom: 50 cm GSD, multispectral
- Video: 4K full-color video at 50 cm/pixel, 30 fps
- Inter-satellite link with SAR satellite to avoid clouds

The OptiSAR™ Constellation: Operational Modes



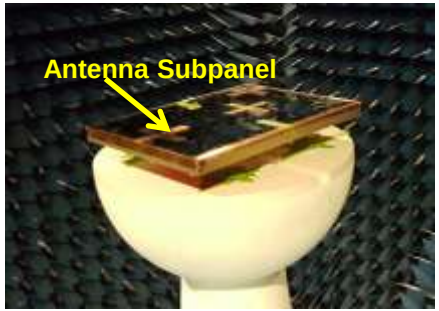
UrtheCast's OptiSAR™ SAR Instrument

OptiSAR™ unique SAR system, fully developed in-house with 9 patents filed to date

Multi-frequency:	Digital SAR with X-band and L-band, simultaneously
Multi-aperture:	Four independent apertures
Digital beam forming:	Gives tremendous SAR-mode flexibility, 2-axis electronic steering
Quad polarization:	Full quad-pole in L-band (including dual & cross pole)

We have already completed testing of prototype SAR hardware

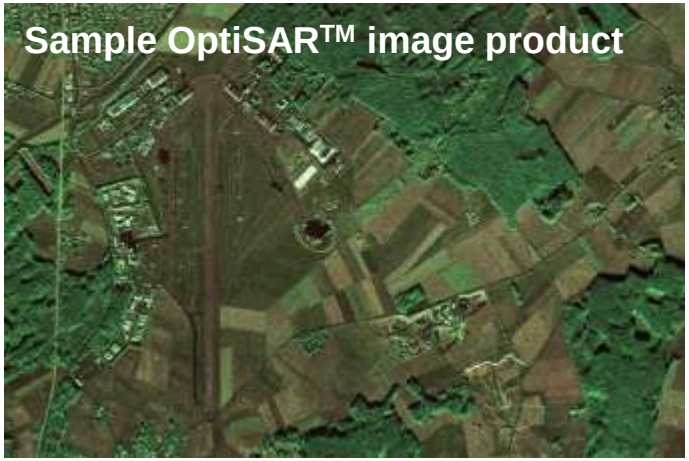
Test results confirmed expected performance

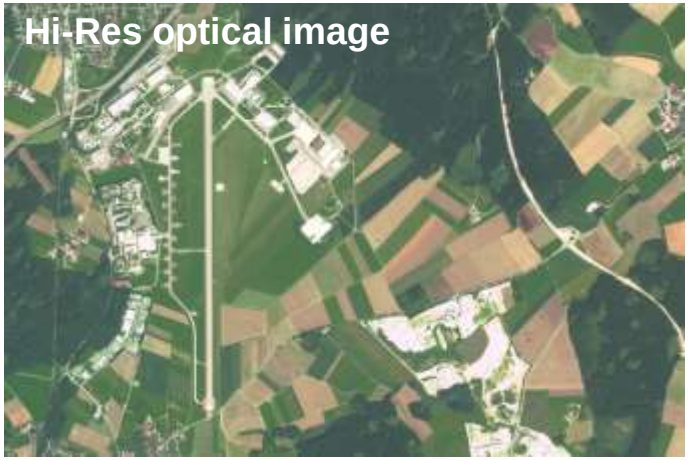


The OptiSAR™ Image Product

An '**information product**' that looks like an optical image:

- Derived entirely from the SAR data
- Uses proprietary SAR processor that's 'trained' by the optical data
- Available every day: rain or shine, day or night
- Deep information content
- Much easier to interpret than traditional SAR





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Combining UrtheDaily™ and OptiSAR™

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Integrated Operations - UrtheDaily™ and OptiSAR™

Daily, global Tipping & Cueing between the two Constellations

Tipping: **5-m change detection with UrtheDaily™**

Cueing: **50 cm OptiSAR™ imagery**

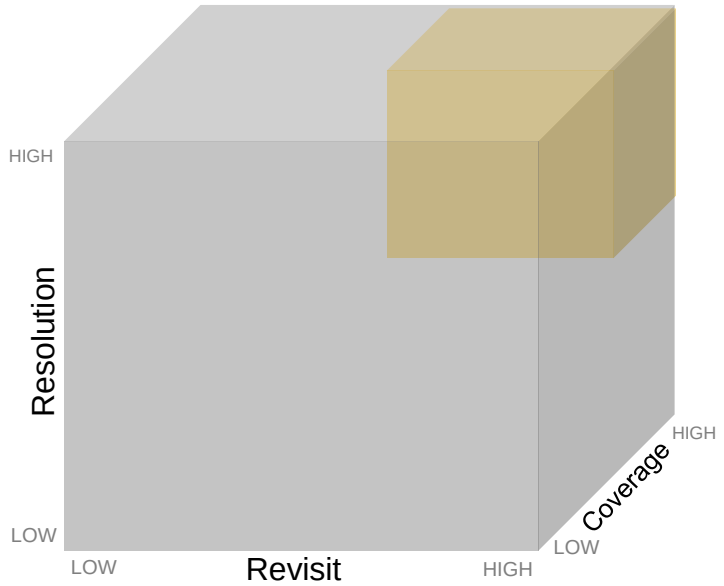
A Combined Offering that's Unmatched

With OptiSAR™ and UrtheDaily™:

Resolution
In the highest class (OptiSAR)

Revisit
By far the highest (OptiSAR + UrtheDaily)

Coverage
By far the highest (OptiSAR + UrtheDaily)



Our Vision of the “Democratization of EO”

Provide unhindered and near universal access of EO imagery and data

- …at affordable price point
- …in formats and on platforms that do not require expertise
- …within an eco-system that attracts third-party investment and innovation (Apps)
- …that significantly broaden the utility of the data for organizations and individuals

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From Earth Observation to GeoAnalytics

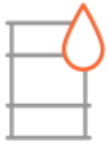
A source-agnostic, cloud-based ecosystem for ingesting, displaying, exploiting, and distributing satellite data, imagery, and video to monitor our constantly-changing world.

Forestry

Environment

Agriculture

Water



Trading / Commodities

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Defense

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Conclusions