Space-borne Tsunami Warning System

The need for early warning

December 26, 2004

The largest Tsunami in history killed over 260,000 people and caused an economic damage of over €6 billion.

A large number of casualties could have been prevented with an early Tsunami warning.

Application of new GNSS technologies enables the development of a global space-borne Tsunami early warning system. The first step has been made...
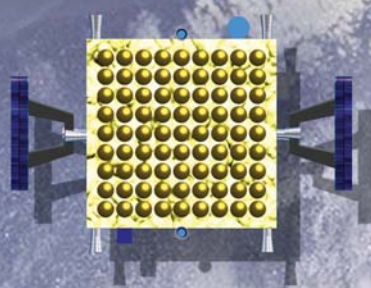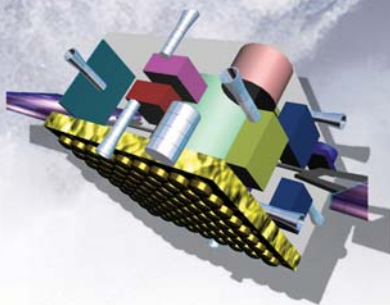
Space-borne Tsunami Warning System (STWS) characteristics:

• Uses GNSS-Reflections (GNSS-R)
• Global coverage
• Detects sea level increase of 10 cm
• Exceeds performance of contemporary warning systems

• Constellation of 40 satellites
• LEO 645 km altitude
• Intersatellite communication for continuous downlink
• Detection time of 30 minutes
• Multiple dedicated launches

• Other data applications possible (wind measurements, ice measurements, soil moisture, oil stains)
• Cost competitive in 20 years

Total STWS cost: €540 million
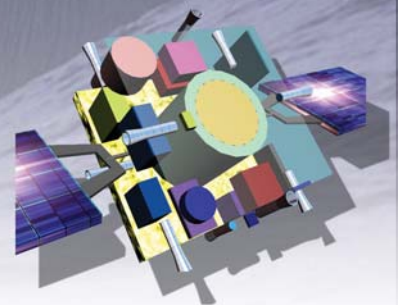
Demonstrator mission characteristics:

• Gain experience with GNSS-R technology
• Prove feasibility of the main mission

Mass: 130 kg
Power: 145 Watts
Datarate: 300 kB/s
Piggyback launch candidate, December 2009, Tanegashima, Japan

Payload:
GNSS and GNSS-R antenna of 25dB, digital beamsteering, 100° field of view, 1200 km swath

Total demonstrator cost: €15 million

Presentation: 14:15h, lecture room C

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