

IAF EARTH OBSERVATION SYMPOSIUM (B1)  
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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EARTH OBSERVATION FROM NEAR-EQUATORIAL ORBITS WITH SMALL AND VERY SMALL  
SATELLITES: “EQUATORIAL SENTINELS” FOR ENVIRONMENT

**Abstract**

There is an urgent need to better understand the environmental phenomena that are threatening the populations that live in equatorial regions: Typhoons, floods, earthquakes, tsunamis, volcanoes, wildfires, pollutions etc. due to climate change and geo-hazards are causing huge damages to the societies and huge financial losses to the economies. Forecast models are existing but with limited accuracy and available data have a poor sampling above equatorial regions, especially for fast-varying phenomena. To improve this situation, new data are mandatory.

Missing data could be provided by a constellation of environmental satellites in near-equatorial orbit – so called “Equatorial Sentinels” – that would fully exploit the exceptional revisit time offered by this orbit (10 times better than polar orbit!). This would help to better understand extreme events and to mitigate their impact. On-board these “Equatorial Sentinels”, all kind of space sensors and technologies must be considered, with emphasis on innovative small satellites and nanosatellite pathfinders: cheaper and faster to develop, they disruptive potential must be assessed and optimized in terms of cost/benefit/risk.

“Equatorial Sentinels” should not replace but complement the fleet of global environmental satellites owned by big space countries (e.g.: NASA, ESA, JAXA etc), with focus on filling the data gap above equatorial regions. Therefore, the door is opening to the use of small and/or very small satellites.

“Equatorial Sentinels” would not only benefit the equatorial regions but also benefit the rest of the planet, by feeding global and regional models with unique high revisit time measurements. Therefore, we expect several opportunities of collaboration between interested countries.

“Equatorial Sentinels” would also bring many business opportunities for the public and private stakeholders that will have invested in this concept. These new and quite unique equatorial data, with unprecedented revisit time, would certainly trigger a sustainable development of new services and new applications for the benefit of governments and citizens.