3rd IAA LATIN AMERICAN CUBESAT WORKSHOP
5th Dec, 2018 | 11:30 – 11:45 am

Simulation of Cubesats in orbit: Path and collision risks

Facens
FACULDADE DE ENGENHARIA DE SOROCABA

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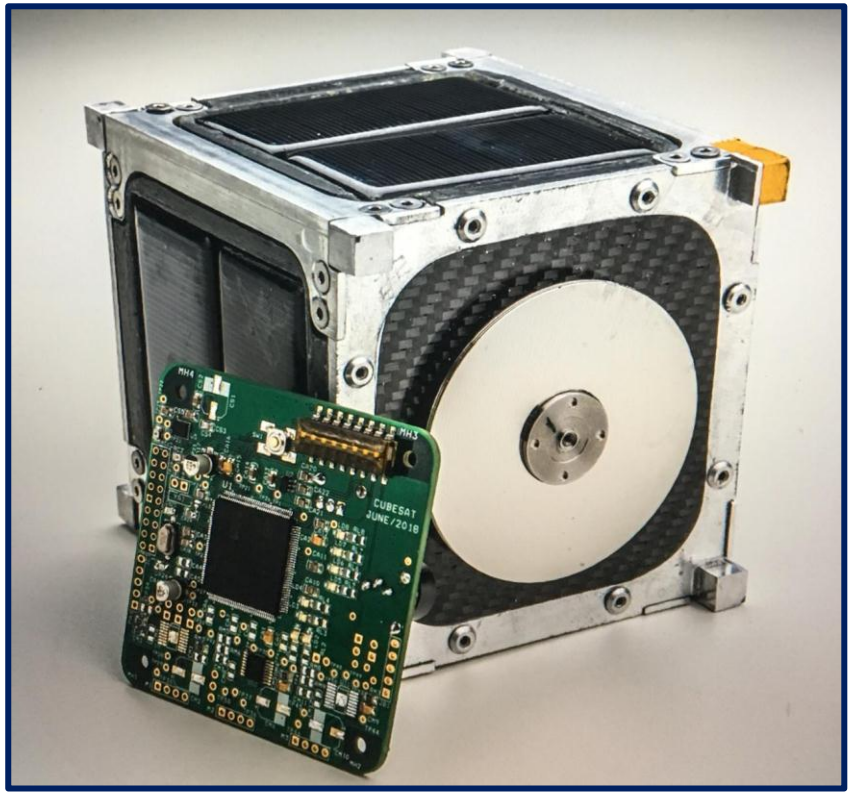
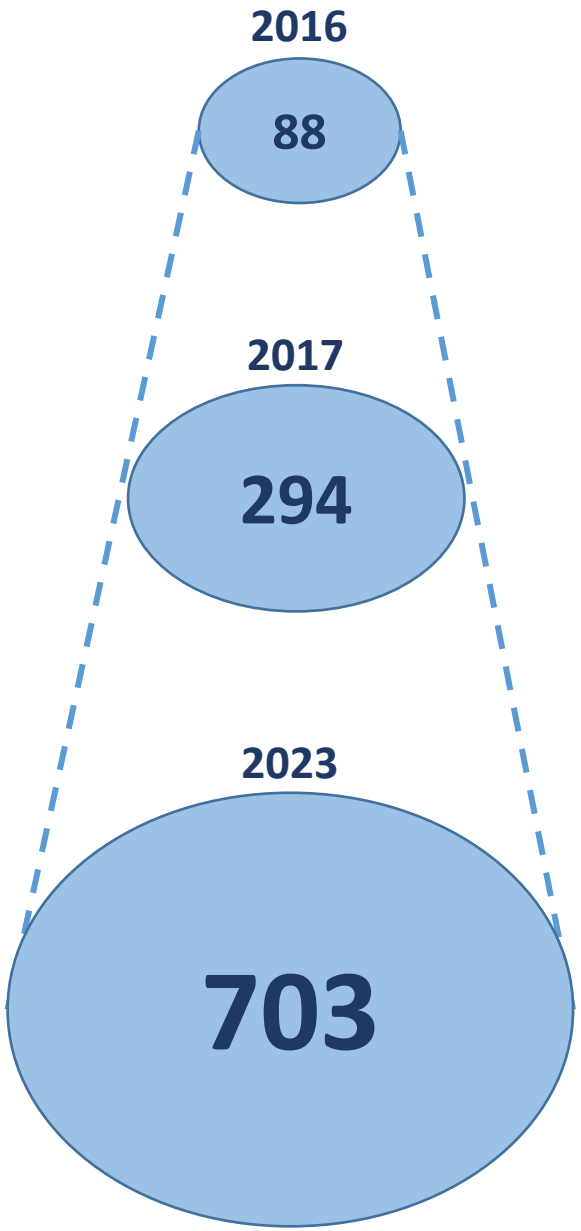
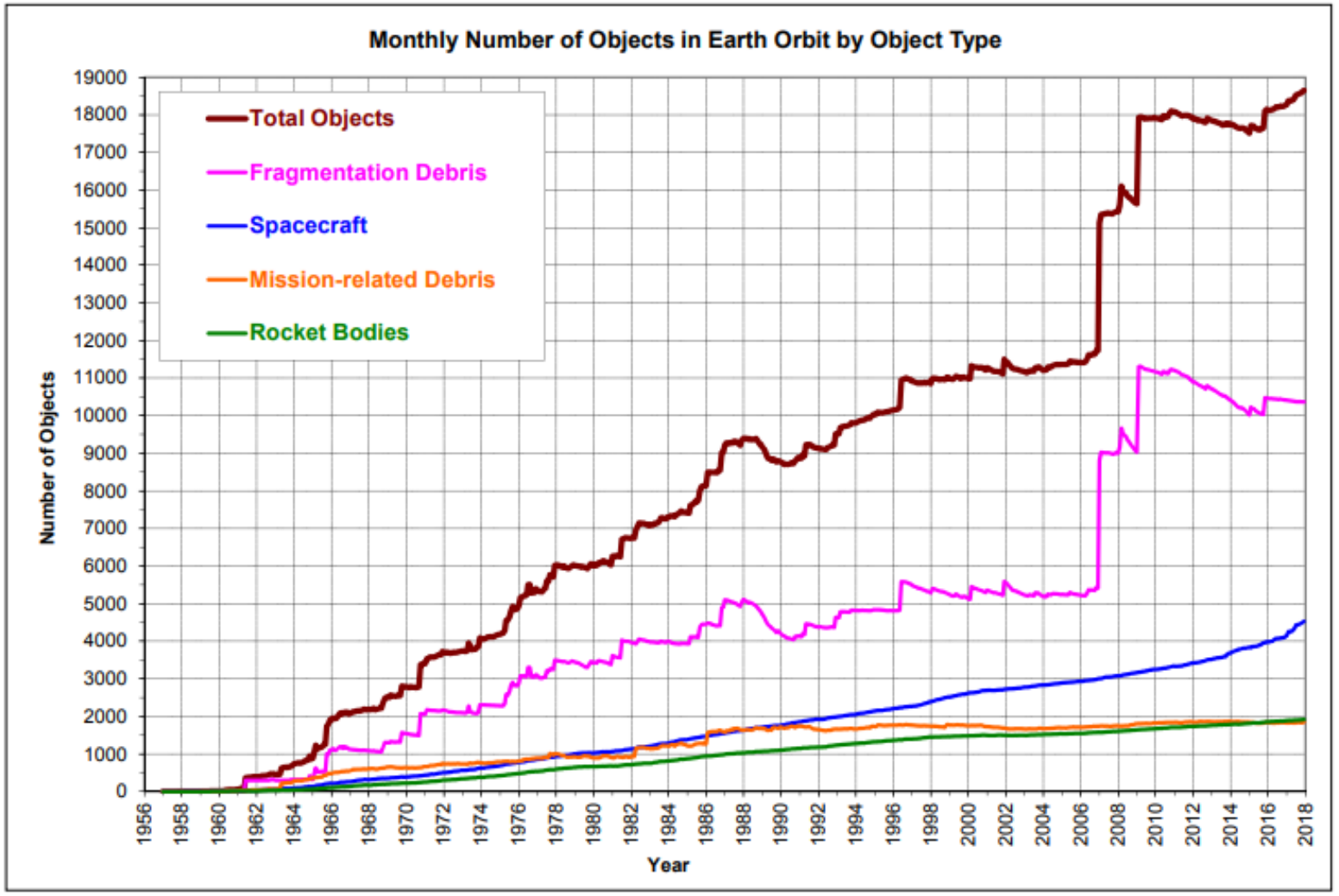


Experiences

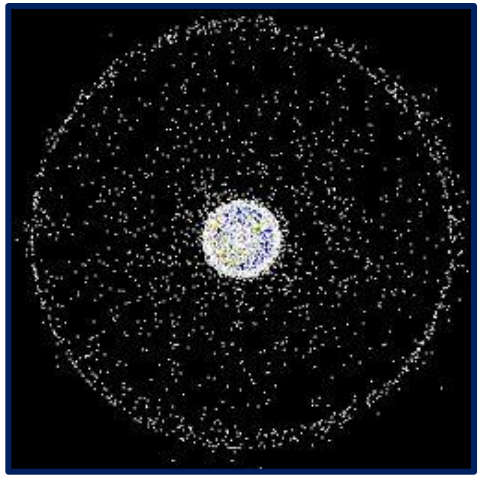
Cubesat Launches





Monthly Number of Cataloged Objects in Earth Orbit by Object Type: This chart displays a summary of all objects in Earth orbit officially cataloged by the U.S. Space Surveillance Network. "Fragmentation debris" includes satellite breakup debris and anomalous event debris, while "mission-related debris" includes all objects dispensed, separated, or released as part of the planned mission.

Kessler Syndrome



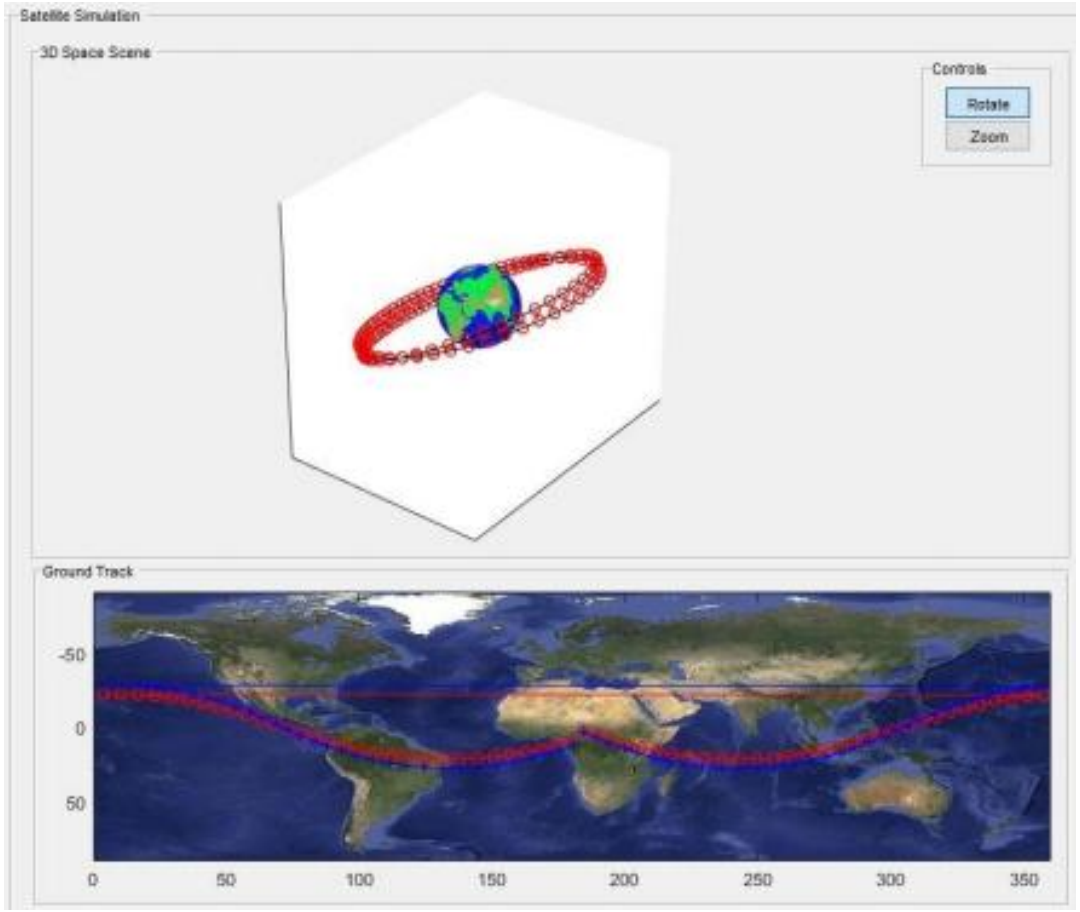
Rank	International Designator		Common Name	Year of Breakup	Altitude of Breakup	Cataloged Debris	Debris in Orbit	Assessed Cause of Breakup
1	1999	25	Fengyun-1C	2007	850	3428	2880	intentional collision
2	1993	36	Cosmos 2251	2009	790	1668	1141	accidental collision
3	1994	29	STEP-2 Rocket Body	1996	625	754	84	accidental explosion
4	1997	51	Iridium 33	2009	790	628	364	accidental collision
5	2006	26	Cosmos 2421	2008	410	509	0	unknown
6	1986	19	SPOT-1 Rocket Body	1986	805	498	32	accidental explosion
7	1965	82	OV2-1 / LCS 2 Rocket Body	1965	740	473	33	accidental explosion
8	1999	57	CBERS 1 / SACI 1 Rocket Body	2000	740	431	210	accidental explosion
9	1970	25	Nimbus 4 Rocket Body	1970	1075	376	235	accidental explosion
10	2001	49	TES Rocket Body	2001	670	372	80	accidental explosion
						9137	**5059**	

* as of 04 January 2016

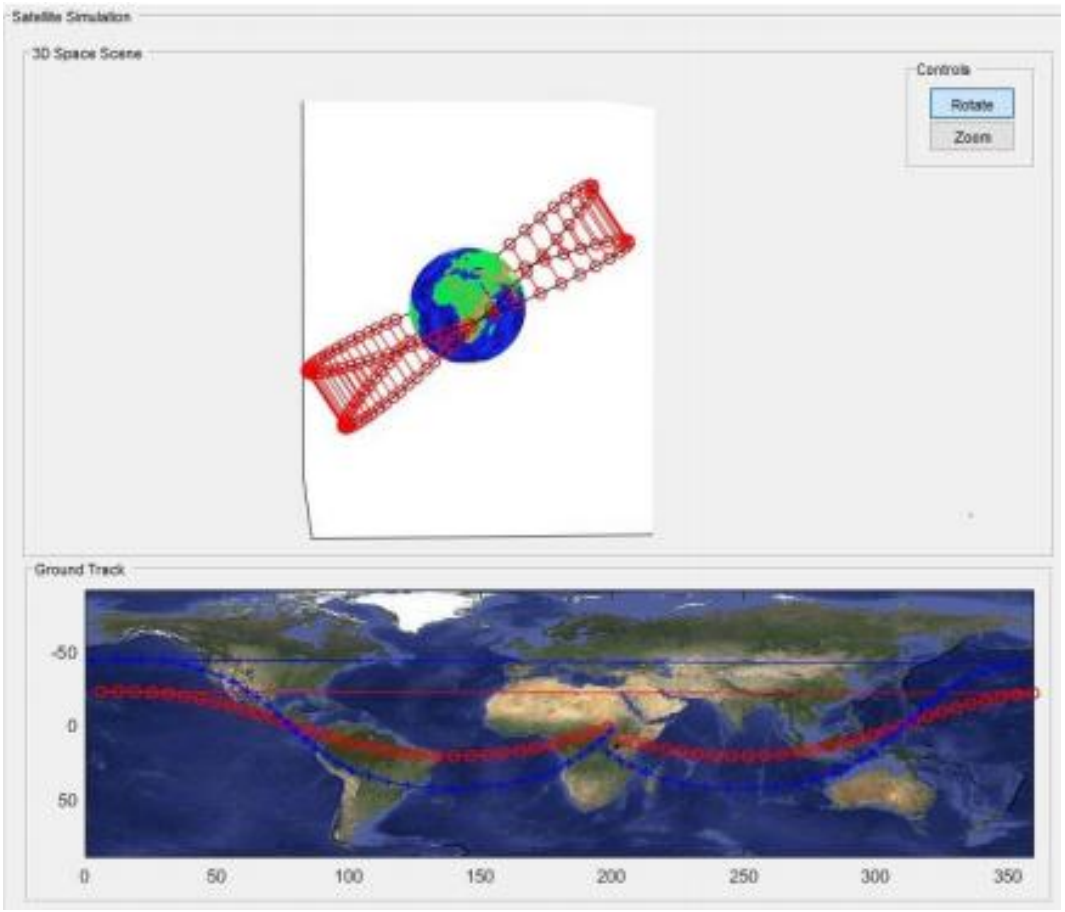
*Erik Kulu, Nanosatellite & CubeSat Database, www.nanosats.eu

Simulations

Low Relative Speed

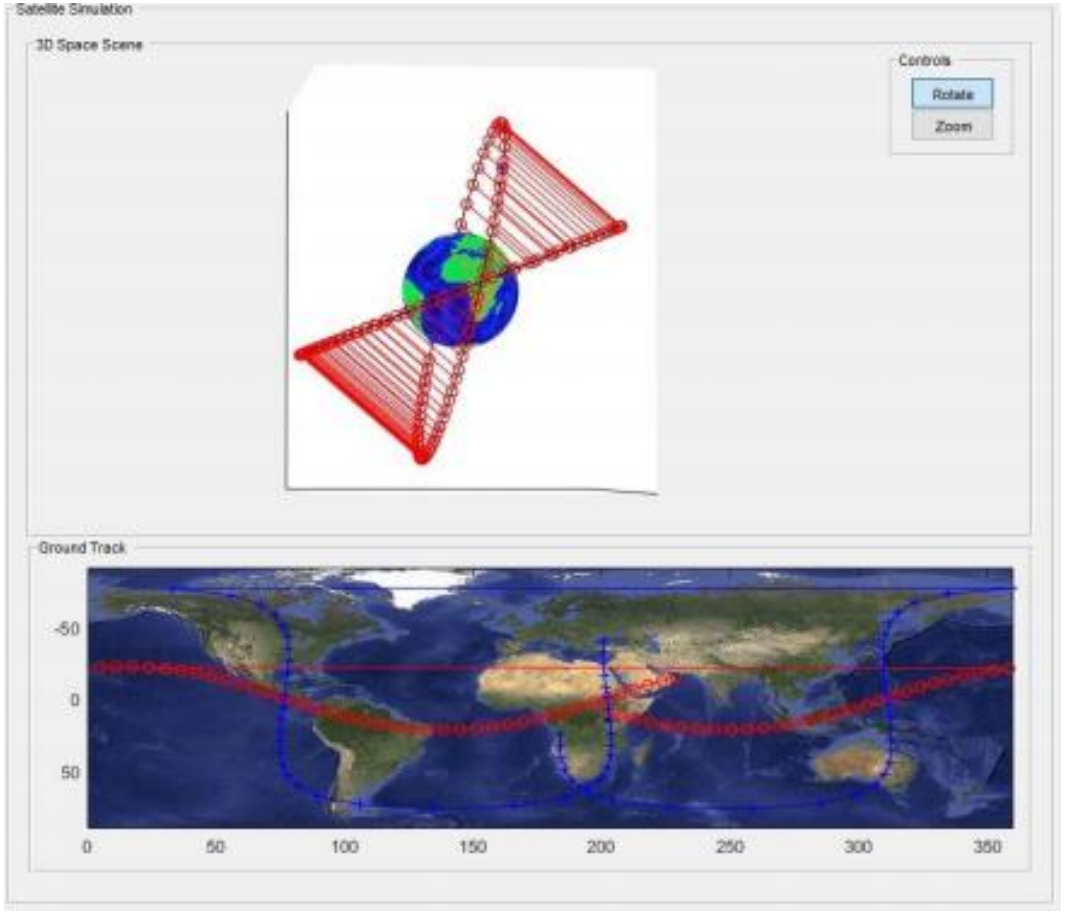


Medium Relative Speed

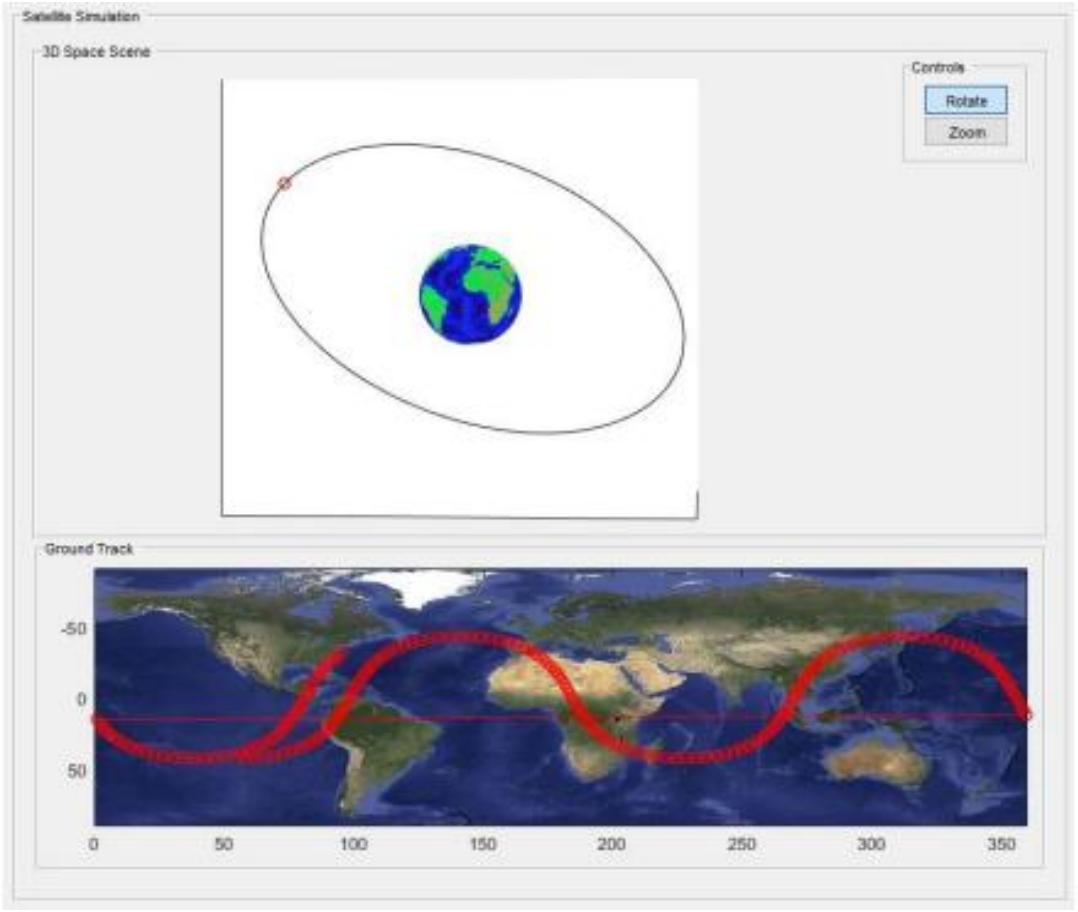


Simulations

High Relative Speed



Real Simulation

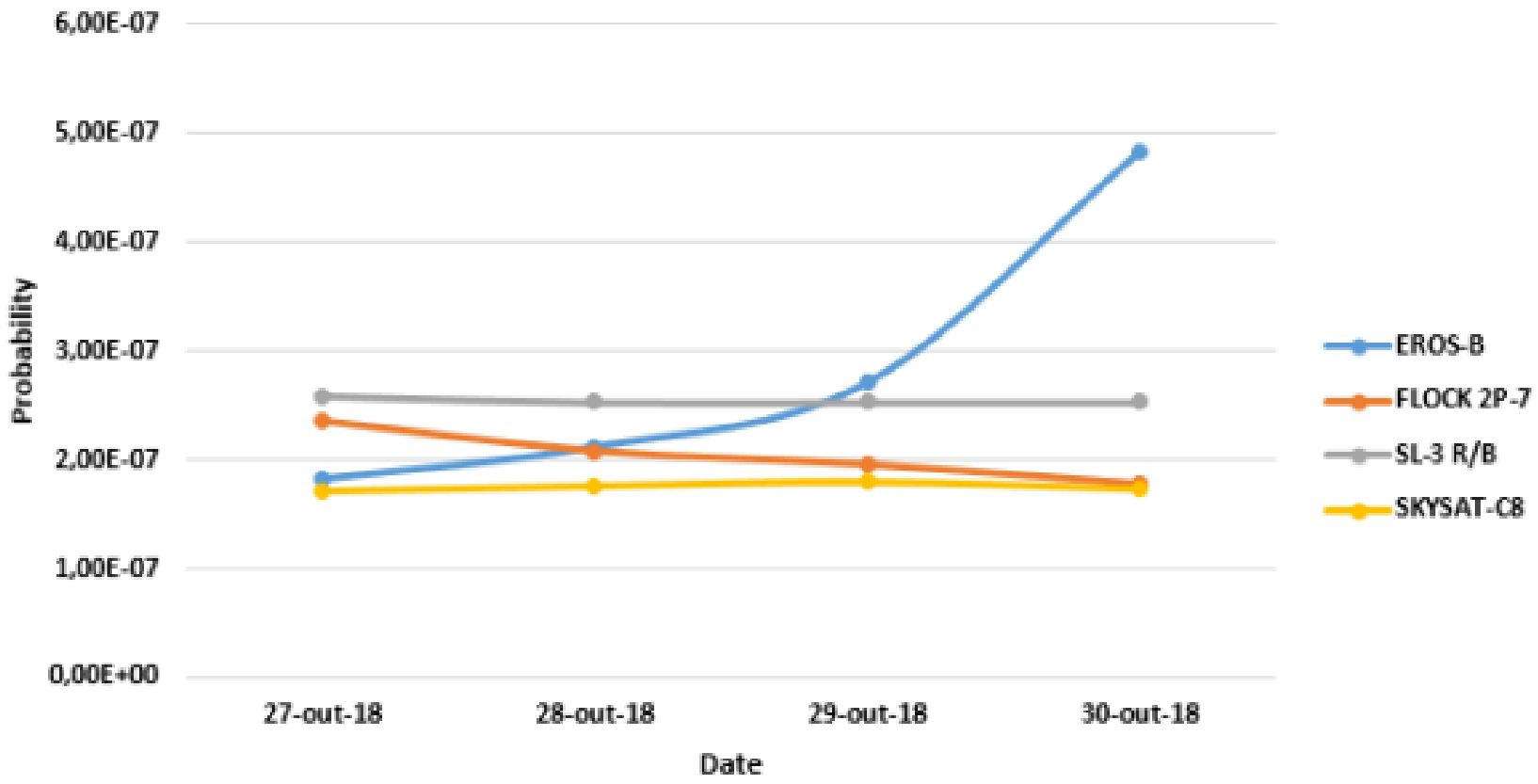


SOCRATES

Satellite Orbital Conjunction Reports Assessing Threatening Encounters in Space

CSSI Center For Space Standards & Innovation

Demosat-2 Collision Probability



Conclusions:

- Despite the increase of the number of cubesats being launched and the intent to higher this number, cubesats aren't the biggest concern when we talk about space debris.

- In the future, it's possible to analyze the same propostian but focused on satellities or even research about manners of reduce the number of debris.

Questions?

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