

ALSAT-2A MISSION: EXPERIENCE OF TWO YEARS OF OPERATIONS

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Abstract: ALSAT-2A is the second Earth Observation spacecraft for Algeria and it is the first satellite of a constellation composed of ALSAT-2A and ALSAT-2B. It has been launched by PSLV-C15 on 12th July 2010 from Sriharikota, Chennai (India) at 03h52' UT. On 21st July, the satellite has been placed on its mission orbit. This was the starting point of the routine operations to be performed daily by Algerian Space Agency's Flight Dynamics team. This paper presents the main events during the 2 years of operations. It namely describes the Orbit maintenance maneuvers that were performed in the past months for Ground track correction. It also highlights the treatment of several Conjunction Summary Message CSM provided by United States Joint Space Operations Center (JSpOC) and the first experiences of ASAL with avoidance maneuvers during the two first years.

Number	Primary Object	Secondary Object	TCA	Overall Distance (m)	Radial (m)	In-Track (m)	Cross-track (m)	Alert	Need of Avoidance Maneuver
1	ALSAT-2A	COSMOS 2251 DEB	30/11/2010 09:05:00.000	618	133.00	52.00	602.00	JSpOC's CSM	No
2	ALSAT-2A	COSMOS 970 DEB	05/06/2011 17:16:07.682	507	-85.80	480.70	-138.10	JSpOC's CSM	Yes
2	ALSAT-2A	COSMOS 970 DEB	05/06/2011 17:16:07.645	796	-79.90	761.90	-218.30	JSpOC's CSM	Yes
2	ALSAT-2A	COSMOS 970 DEB	05/06/2011 17:16:07.711	304	-79.50	282.80	-80.90	JSpOC's CSM	No
3	ALSAT-2A	Known object	29/08/2011 00:38:40.662	682	-185.30	476.60	-451.50	JSpOC's CSM	No
4	ALSAT-1	SL-8 DEB *	17/09/2011 11:08:26.296	463	175.60	-60.20	-425.00	JSpOC's CSM	Yes
5	ALSAT-1	CZ-4B DEB	26/09/2011 05:34:31.837	952	14.50	175.70	936.10	JSpOC's CSM	Yes
6	ALSAT-1	FENGYUN 1C DEB	13/10/2011 11:14:57.755	671	-78.10	-482.70	460.80	JSpOC's CSM	Yes
7	ALSAT-2A	Known object	16/11/2011 12:10:32.671	713	-88.30	120.20	697.50	JSpOC's CSM	No
7	ALSAT-2A	Known object	16/11/2011 12:10:32.546	938	-96.60	158.90	920.10	JSpOC's CSM	No
8	ALSAT-1	PSLV DEB	27/11/2011 01:25:31.782	289	189.10	110.40	189.60	JSpOC's CSM	No
9	ALSAT-1	IRIDIUM 33 DEB	19/12/2011 22:58:33.380	686	676.30	-7.40	117.10	JSpOC's CSM	No
10	ALSAT-1	IRIDIUM 33 DEB	25/12/2011 19:20:11.225	718	54.00	-25.10	716.10	JSpOC's CSM	No
11	ALSAT-1	FENGYUN 1C DEB	29/12/2011 20:34:45.706	664	151.90	398.60	-509.90	JSpOC's CSM	Yes
12	ALSAT-1	THOR ABLESTAR DEB	06/01/2012 15:30:27.124	368	197.40	289.00	116.80	JSpOC's CSM	No
13	ALSAT-1	COSMOS 2251 DEB-34029	24/02/2012 14:06:15.759	614	-167.00	228.40	545.80	JSpOC's CSM	No
14	ALSAT-1	SL-18 DEB	20/03/2012 11:01:01.488	313	22.30	-299.30	-88.90	JSpOC's CSM	Yes
15	ALSAT-2A~	Known object	21/03/2012 19:21:36.209	747	-133.00	-97.70	729.30	JSpOC's CSM	Yes
16	ALSAT-2A	COSMOS 2251 DEB-35440	30/03/2012 23:42:43.848	224	148.60	-61.50	-157.30	JSpOC's CSM	No
16	ALSAT-2A	COSMOS 2251 DEB-35440	30/03/2012 23:42:43.736	976	124.50	340.20	906.40	JSpOC's CSM	No
17	ALSAT-2A	Known object	12/04/2012 19:07:06.756	316	-189.30	-14.00	253.40	JSpOC's CSM	Yes
17	ALSAT-2A	Known object	12/04/2012 19:07:07.128	555	-179.30	-22.50	525.70	JSpOC's CSM	Yes
17	ALSAT-2A	Known object	12/04/2012 19:07:07.128	641	-304.67	-500.85	259.68	by performing avoidance Man	
18	ALSAT-2A	COSMOS 2251 DEB-33806	29/04/2012 09:47:28.630	450	-15.4	55.6	-446.3	JSpOC's CSM	Yes
18	ALSAT-2A	COSMOS 2251 DEB-33806	29/04/2012 09:47:28.769	254	-9.6	27.5	-253.2	JSpOC's CSM	Yes
18	ALSAT-2A	COSMOS 2251 DEB-33806	29/04/2012 09:47:28.755	287	6.5	35.7	-285.5	JSpOC's CSM	Yes
18	ALSAT-2A *	COSMOS 2251 DEB-33806	29/04/2012 09:47:28.755	2003	-71.28	-1994.92	-171.95	by performing avoidance Man	
19	ALSAT-2A	COSMOS 2251 DEB-34753	12/05/2012 12:08:32.590	239	-126.90	124.50	-160.60	JSpOC's CSM	No
19	ALSAT-2A	COSMOS 2251 DEB-34753	12/05/2012 12:08:32.710	818	-94.40	-485.50	652.50	JSpOC's CSM	No

~ Avoidance maneuver not planned because the awareness CSM was sent only 15 hours before TCA

* Avoidance maneuver calculated on the second CSM provided by JSpOC at TCA epoch 29/04/2012 09:47:28.769

Table 1 the summary of CSM from JSpOC

Keywords: ALSAT-2A, station keeping, MCO, CSM, avoidance maneuver