AeroCube-6 (AC6) Dosimeter Data Release

The AC6 Dosimeter data are approved for public release. We ask that you coordinate your study with the instrument team listed below. This coordination will ensure proper considerations for data quality and avoid duplication among related studies.

The AC6 Dosimeter Team:

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A README file is also included:

TOR-2016-01155_AeroCube-6_Dosimeter_Data_README_v3.0.pdf

TOR-2017-02598 - AeroCube-6 Dosimeter Equivalent Energy Thresholds and Flux Conversion Factors.pdf

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The AC6 dataset is provided in 4 ASCII files each day. Survey files contain 1 Hz dosimeter data an minimal ephemeris. Coordinates file contain extended magnetic coordinates at 1 Hz. Attitude files provide detailed attitude information at 1 Hz. 10 Hz files provide the high resolution data taken in burst mode. The data dictionary indicates which quantities are in which file.

Column	Units	1 Hz Survey	1 Hz Mag Coords	1 Hz Attitude	10 Hz	Description
year		x	x	x	x	
month		x	x	x	x	
day		x	x	x	x	
hour		x	x	x	x	
minute		x	x	x	x	
second		x	x	x	x	
alt	km	x	x	x	x	Geodetic altitude
lat	deg	x	x	x	x	Geodetic latitude
lon	deg	x	x	x	x	Geodetic longitude
X_GEO	RE	x				X-GEO component of location
Y_GEO	RE	x				Y-GEO component of location
Z_GEO	RE	x				Z-GEO component of location
dos1l	counts	x			x	Dos1 low output
dos1m	counts	x			x	Dos1 medium output
dos1rate	#/s	x	x	x	x	Dos1 rate (>50 keV electrons, > 600 keV protons)
dos2l	counts	x			x	Dos2 low output
dos2m	counts	x			x	Dos2 medium output
dos2rate	#/s	x	x	x	x	Dos2 rate (>600 keV protons)
dos3l	counts	x			x	Dos3 low output
dos3m	counts	x			x	Dos3 medium output
dos3rate	#/s	x	x	x	x	Dos3 rate (>20 MeV protons A & B, plus >1 MeV electrons on A only)
flag		x	x	x	x	bitmap: 0 - data OK, 1 - ground contact transmitter noise, 2- crosslink transmitter noise, 4 - dubious attitude, 8 - TLE ephemeris, 16 - dos3-A noisy day
Sample_Rate	Hz	x				Sample rate, 1 or 10 Hz
Subcom					x	Slot in multiplexed 10 Hz readout, 0 to 9
Lm_IGRF			x			McIlwain L for locally mirroring particle, IGRF magnetic field
Bmag_IGRF	nT		x			Magnitude of IGRF magnetic field at vehicle
MLT_IGRF	hours		x			Solar local time at equtorial crossing of IGRF magnetic field line through vehicle
InvLat_IGRF	deg		x			Invariant latitude (McIlwain L) for locally mirroring particle, IGRF magnetic field
Lm_OPQ		x	x		x	McIlwain L for locally mirroring particle, OPQ magnetic field
Bmag_OPQ	nT	x	x		x	Magnitude of OPQ magnetic field at vehicle
MLT_OPQ	hours	x	x		x	Solar local time at equtorial crossing of OPQ magnetic field line through vehicle
InvLat_OPQ	deg	x	x		x	Invariant latitude (McIlwain L) for locally mirroring particle, OPQ magnetic field
Loss_Cone_Type		x	x		x	0 - trapped, 1 - drift loss cone, 2 - bounce loss cone, -1 = open/unknown, for locally mirroring particles, OPQ magnetic field
Bx_GEO	nT		x			X-GEO component of local magnetic field, OPQ model
By_GEO	nT		x			Y-GEO component of local magnetic field, OPQ model
Bz_GEO	nT		x			Z-GEO component of local magnetic field, OPQ model
Beq	nT		x			Minimum magnetic field strength on field line through vehicle, OPQ magnetic field
I	RE		x			Integral invariant for locally mirroring particle, OPQ magnetic field
K	G^{1/2} RE		x			Kaufmann invariant for locally mirroring particle, OPQ magnetic field
K_Z	G^{1/2} RE		x			Kaufmann invariant for normally incident particle, OPQ magnetic field
Lstar		x	x			Modified third invariant (L*) for locally mirroring particle, OPQ magnetic field
Lstar_Z			x		x	Modified third invariant (L*) for normally incident particle, OPQ magnetic field
hmin	km	x	x			Minum mirror altitude around drift shell for locally mirroring particle, OPQ magnetic field
hmin_Z	km		x		x	Minum mirror altitude around drift shell for normally incident particle, OPQ magnetic field
Loss_Cone_Near	deg		x			Polar angle of near hemisphere loss cone (100 km), OPQ magnetic field
Loss_Cone_Far	deg		x			Polar angle of opposite hemisphere loss cone (100 km), OPQ magnetic field

Column	Units	1 Hz Survey	1 Hz Mag Coords	1 Hz Attitude	10 Hz	Description
B100N	nT		x			OPQ magnetic field strength at 100 km altitude, northern hemisphere on field line through vehicle
LAT100N	deg		x			Geodetic latitude at 100 km altitude, northern hemisphere, on OPQ magnetic field line through vehicle
LON100N	deg		x			Geodetic longitude at 100 km altitude, northern hemisphere, on OPQ magnetic field line through vehicle
B100S	nT		x			OPQ magnetic field strength at 100 km altitude, southern hemisphere on field line through vehicle
LAT100S	deg		x			Geodetic latitude at 100 km altitude, southern hemisphere, on OPQ magnetic field line through vehicle
LON100S	deg		x			Geodetic longitude at 100 km altitude, southern hemisphere, on OPQ magnetic field line through vehicle
Alpha	deg	x		x	x	Local pitch angle of normally incident particle, OPQ magnetic field
Alpha_X	deg			x		Local pitch angle of particle moving along spacecraft X axis, OPQ magnetic field
Alpha_Y	deg			x		Local pitch angle of particle moving along spacecraft Y axis, OPQ magnetic field
Alpha_Eq	deg	x		x		Equatorial pitch angle of normally incident particle, OPQ magnetic field
Beta	deg	x		x	x	Gyrophase angle of normally incident particle, OPQ magnetic field
Beta_X	deg			x		Gyrophase angle of particle moving along spacecraft X axis, OPQ magnetic field
Beta_Y	deg			x		Gyrophase angle of particle moving along spacecraft Y axis, OPQ magnetic field
Phi_B	deg	x		x		Longitude of OPQ magnetic field in sensor coordinates
OmegaX_GEO	rad/s			x		X-GEO component of spin axis
OmegaY_GEO	rad/s			x		Y-GEO component of spin axis
OmegaZ_GEO	rad/s			x		Z-GEO component of spin axis
B_Spin	deg			x		Angle between OPQ magnetic field and spin axis
Spin_Sun	deg			x		Angle between spin axis and sun
Dist_In_Track	km	x			x	In track distance, AC6A - AC6B
Lag_In_Track	s	x			x	In track time separation, AC6A - AC6B
Dist_Cross_Track_Horiz	km	x			x	Horizontal cross-track distance, AC6A - AC6B, Positive is East
Dist_Cross_Track_Vert	km	x			x	Vertical cross-track distance, AC6A - AC6B
Dist_Total	km	x			x	Total separation distance, AC6A - AC6B