

PARAMETERS	DESCRIPTION OF PARAMETERS
Date	Date of Forbush-decrease onset
Time	Time of Forbush-decrease onset
OType	Type of FD onset: 1 – interplanetary shock wave and SSC; 2 – interplanetary shock wave; 3 – weak SSC; 9 – FD onset without shock wave and SSC
SDate, STime	Date and time of parent solar event (as a rule, the start of an X-ray flare, associated with CME)
SType	Type of solar source: 1 – ejection from an active region, accompanied by a solar flare; 2 – CME, associated with solar filament eruption from region beyond sunspot group; 1.5 – merged event with influence of 1 and 2; 9 – clear influence of HSS from CH without other influences; 9 – well pronounced influence of HSS from CH without significant other influences; 3-7 – mixed event with contributions from HSS from CH and CME; 10 – FD from far west solar source; 20 – FD from far east solar source.
Source	Partially formalized description of the solar source
Qs	Quality of FD identification with solar source (5 - Confident identification, 4 - Reliable enough, 3 - Doubtful, 2 and 1 - Unreliable)
Vsp	CME velocity near the Sun, calculated in [Michalek G., Gopalswamy N., Lara A., Yashiro S. Properties and geoeffectiveness of halo coronal mass ejections // Space Weather. V. 4. N. 10. CiteID S10003. 2006]
Vmean	The average CME velocity between the Sun and the Earth, calculated using the time of the beginning of the associated X-ray flare
VmeanC	The average CME velocity between the Sun and the Earth, calculated using the time of the beginning of the associated CME observations
Vmax	Maximal hourly solar wind speed in the event
TVmax	Time (in hours) from the event onset to solar wind speed maximum
HMax	Maximal hourly IMF strength in the event
THmax	Time (in hours) from the event onset to IMF strength maximum
VmHm	Normalized product of hourly maxima of solar wind speed and IMF strength
Bzmin	Minimal hourly Bz component of the IMF in the event
ABzmax	Maximal absolute value of Bz component of the IMF
BzmtoBm	Ratio of minimal hourly Bz component of the IMF to maximal IMF
KTMax	The maximum value of the ratio (KT) of the observed hourly average temperature of the solar wind to the temperature, calculated from the velocity of the SW
Tktmax	Time from the event onset to KTMax
KTMin	The minimal value of the ratio (KT) of the observed hourly average temperature of the solar wind to the temperature, calculated from the velocity of the SW
Tktmin	Time from the event onset to Tktmin

BeMax	Maximal hourly plasma Beta in the event
Tbemax	Time from the event onset to BeMax
BeMin	Minimal hourly plasma Beta in the event
Tbemin	Time from the event onset to BeMin
Rbulk	An estimate of the maximum proton rigidity (in GV) that can be reflected by the total magnetic field, integrated from the event onset to the FD minimum
H2Sum	Sum of interplanetary magnetic field energy, integrated from the event onset to the FD minimum
Magn	FD magnitude for particles with 10 GV rigidity, calculated as maximal range CR density variations in the event, obtained by GSM from NM network data
MagnM	FD magnitude for particles with 10 GV rigidity, corrected on magnetospheric effect with Dst-index
MagnL	FD magnitude from one station daily data from Lockwood catalogue [Lockwood J.A. List of Forbush decreases 1954-1990 with supplemental information // Solar Geophys. Data, 1990. N. 549. P. 154-163]
MagnC	Reserved for FD, observed at the satellites
Range	maximal range CR density variations for particles with 10 GV rigidity in the event, calculated automatically
TMin	Time from the FD onset to minimum
TMinM	Time from the FD onset to minimum, calculated from the data corrected for magnetospheric effect
DMin	Maximal hourly decrease of CR density in the event
TDMn	Time from the FD onset to DMin
DMinM	Maximal hourly decrease of CR density in the event, calculated from the data corrected for magnetospheric effect
TDMinM	Time from the FD onset to DMinM
GrDmin	Evaluation of the radial component of CR density gradient in the moment DMin
DMax	Minimal hourly increase of CR density in the event
TDMax	Time from the FD onset to DMax
AftoB	Ratio of FD magnitude to the IMF strength
GammaM	Power law exponent of the rigidity dependence in the minimum CR density hour
GammaD	Averaged power law exponent of the rigidity dependence in the period closed to the CR density minimum [А. И. Ключева, А. В. Белов, Е. А. Ерошенко. Особенности жесткого спектра эффектов Форбуша // Геомагнетизм и Аэрономия. Т.52 № 2. С. 195-207. 2017]
Tbef	Time (in hours) from the previous FD onset to onset of this event
Taft	Time (in hours) from the onset of this event to the next FD onset
TFrom	Minimum from Tbef and Taft
Kpmax	Maximal Kp-index in the event
Apmax	Maximal 3-hour Ap-index in the event
Dstmin	Minimal Dst-index in the event
TDstmin	Time from the event onset to Dstmin

Fdata	Associated X-ray flare data
Xmagn	Maximal X-ray flare power (Watts/m <sup>2</sup> )
Hlat и Alat	Heliolatitude and absolute value of heliolatitude of the associated X-ray flare
HLon	Heliolongitude of the associated X-ray flare
SDur	Duration (in minutes) of the associated X-ray flare
Axym	Maximal value of the equatorial component of the CR vector anisotropy in the event (in %)
Txymax	Time from the event onset to the hour of Axym (in hours)
Axm и Aym	Radial and azimuthal components of maximal value of the equatorial component of the CR vector anisotropy (in %)
Azrange	Range of the north-south component variation of the CR vector anisotropy in the event (in %)
Pxym	Phase (direction in degrees) of maximal value of the equatorial component of the CR vector anisotropy. Pxym = 0 – direction from the Sun, Pxym = 90 – direction from East to West
Axdm, Aydm и Azdm	Radial, azimuthal and north-south components of the CR vector anisotropy at the hour of Dmin (in %)
Axydm	equatorial component of the CR vector anisotropy at the hour of Dmin (in %)
Pxydm	Phase (direction in degrees) of the equatorial component of the CR vector anisotropy at the hour of Dmin. Pxydm = 0 – direction from the Sun, Pxydm = 90 – direction from East to West
D01	Difference (in %) between CR density at the first hour after FD onset and an hour before FD onset
D02	Difference (in %) between CR density at the second hour after FD onset and an hour before FD onset
AD02	Absolute value of D02
AxytoAf	Ratio of maximal equatorial component of the anisotropy to FD magnitude
Axb, Ayb, Azb	Radial, azimuthal and north-south components of the CR vector anisotropy at the hour before FD onset (in %)
Axyb	equatorial component of the CR vector anisotropy at the hour before FD onset (in %)
Pxyb	Phase (direction in degrees) of the equatorial component of the CR vector anisotropy at the hour before FD onset. Pxyb = 0 – direction from the Sun, Pxyb = 90 – direction from East to West
Ax0, Ay0, Az0	Radial, azimuthal and north-south components of the CR vector anisotropy at the FD onset hour (in %)
Axy0	equatorial component of the CR vector anisotropy at the FD onset hour (in %)
Pxy0	Phase (direction in degrees) of the equatorial component of the CR vector anisotropy at the FD onset hour. Pxy0 = 0 – direction from the Sun, Pxy0 = 90 – direction from East to West
Ax1, Ay1, Az1	Radial, azimuthal and north-south components of the CR vector anisotropy at the first hour after FD onset (in %)
Axy1	equatorial component of the CR vector anisotropy at the first hour after FD onset (in %)
Pxy1	Phase (direction in degrees) of the equatorial component of the CR vector anisotropy at the first hour after FD onset. Pxy1 = 0 – direction from the Sun, Pxy1 = 90 – direction from East to West
dx1b	Difference (in %) between Ax1 and Axb
dy1b	Difference (in %) between Ay1 and Ayb
dz1b	Difference (in %) between Az1 and Azb
dxy1b	Difference (in %) between Axy1 and Axyb

dA11b	Variation of the Axy-component of the CR anisotropy between the hour before FD onset and the hour after FD onset: $dA_{xyb1} = \sqrt{dAx_{b1}^2 + dAy_{b1}^2}$
dz1b	Variation of the north-south component of the CR anisotropy between the hour before FD onset and the hour after FD onset
Adz1b	Absolute value of dz1b
dPxy1b	Change of Axy-component direction: $dPA_{xyb1} = \arccos\left(\frac{Ax1 \cdot Axb + Ay1 \cdot Ayb}{\sqrt{Axb^2 + Ayb^2} \sqrt{Ax1^2 + Ay1^2}}\right)$
Pdxy1b	Direction of Axy-component change: $PdA_{xyb1} = \arctg(dAy_{1b}/dAx_{1b})$
DP1b	Change of full anisotropy vector direction between the hour before FD onset and the hour after FD onset: $DPA_{b1} = \arccos\left(\frac{Ax1 \cdot Axb + Ay1 \cdot Ayb + Az1 \cdot Azb}{\sqrt{Axb^2 + Ayb^2 + Azb^2} \sqrt{Ax1^2 + Ay1^2 + Az1^2}}\right)$
CMEDate, CMETime	Date and time of related CME registration
CMEWidth	Angle width of related CME
CMEAngle	Maximal speed direction of related CME
MCStartDate, MCStartTime	Date and time of magnetic cloud onset, it was observed in ICME [Richardson, I.G. and Cane, H. Near-Earth Interplanetary Coronal Mass Ejections During Solar Cycle 23 (1996 - 2009): Catalog and Summary of Properties // 2010, Solar Phys. 264, 189.]
MCDur	Duration (in hours) of magnetic cloud
RMC	Size (in larmor radii for 10 GV rigidity particles) of magnetic cloud [Belov, A.; Abunin, A.; Abunina, M.; Eroshenko, E.; Oleneva, V.; Yanke, V.; Papaioannou, A.; Mavromichalaki, H. Galactic Cosmic Ray Density Variations in Magnetic Clouds // Solar Physics, Volume 290, Issue 5, pp.1429-1444, 2015]
EruptA	Eruptive magnetic flux for posteruptive arcades, associated with the CME [Chertok, I. M.; Grechnev, V. V.; Belov, A. V.; Abunin, A. A. Magnetic Flux of EUV Arcade and Dimming Regions as a Relevant Parameter for Early Diagnostics of Solar Eruptions - Sources of Non-recurrent Geomagnetic Storms and Forbush Decreases // Solar Physics, Volume 282, Issue 1, pp.175-199, 2013]
EruptD	Eruptive magnetic flux for dimmings, associated with the CME
EruptAD	Eruptive magnetic flux for dimming and arcades, associated with the CME
Ind	Index for event features: -11 – disturbed background before the event; -5, -4 – boundary of months; 99 – second interplanetary shock in the first hours after FD onset; 95 – second interplanetary shock in the first 4-7 hours after FD onset
SPol	Magnetic polarity of the solar source (mostly for coronal holes)
GLE	Index of the GLE influence at the CR data in the event (maximal increase of NM count rates (in %)).
SSN	Number of sunspot at the FD onset day
Var1, Var2	Reserved fields for special calculations
Rem	Remarks

Примечание: данные о CME взяты из базы данных SOHO/LASCO ([https://cdaw.gsfc.nasa.gov/CME\\_list/](https://cdaw.gsfc.nasa.gov/CME_list/))