Table 1
List of balloon SEP events in the solar cycles 19–23 (see text). The observations in the Lebedev Physical Institute started in July 1957. "Mu" stands for the Murmansk region, "Mi", for the Mirny observatory (Antarctica), "Mo" for the Moscow region. "d" means the day of a month.

#	Day	Month	Year	Site of the first observation	Time of the first observation, UT	Whole time of observations in the stratosphere	Number of balloon launches	Sites of observations
1	8	7	1958	Mu	0757–0922	8d	1	Mu
2	22	8	1958	Missed				
3	26	8	1958	Mu	0808–0831	26d	1	Mu
4	10	5	1959	Mu	11d0809–0850	11–13d	4	Mu
5	9	7	1959	Mu	0853–0901	9–13d	7	Mu
6	14	7	1959	Mu	0830–0901	14–16d	4	Mu
7	16	7	1959	Mu	17d0732–0758	17–21d	6	Mu
8	1	4	1960	Mu	1004–1041	1d	2	Mu
9	28	4	1960	Mu	0807–0838	28–29d	4	Mu
10	4	5	1960	Mu	1100–1134	4–5d	4	Mu
11	13	5	1960	Mu	0814–0858	13d	2	Mu
12	3	9	1960	Mu	0814–0859	3–5d	11	Mu
13	12	11	1960	Mu	14d0801–0830	14d	4	Mu
14	15	11	1960	Mu	0729–0828	15–19d	11	Mu
15	20	11	1960	Mu	21d1307–1336	21d	1	Mu
16	12	7	1961	Mu	2019–2041	12–13d	2	Mu
17	18	7	1961	Mu	19d0756–0820	19–20d	6	Mu
18	20	7	1961	Mu	1645–1721	20–21d	3	Mu
19	28	9	1961	Missed				
20	21	9	1963	Mu	0704–0758	21d	2	Mu, Mi
21	26	9	1963	Mi	0742–0807	26d	1	Mi
22	7	7	1966	Mi	0758–0842	7d	1	Mi
23	28	8	1966	Missed				
24	2	9	1966	Mu	0753–0844	2d	6	Mu, Mi
25–26*	28	1	1967	Mu	1236–1326	28–31d	9	Mu, Mi
27	23	5	1967	Missed				
28	28	5	1967	Mu	0856–0937	28–29d	3	Mu
29	9	6	1968	Mu	10d0834–0911	10d	2	Mu
30	29	9	1968	Missed				
31	18	11	1968	Mu	1238–1311	18d	2	Mu
32	25	2	1969	Mu	1250–1331	25d	2	Mu
33	26	2	1969	Mu	0656–0722	26–28d	8	Mu, Mi
34	30	3	1969	Mu	0756–0833	30–04d	27	Mu, Mi
35	11	4	1969	Mu	12d0819–0827	12–15d	16	Mu, Mi
36	2	11	1969	Mu	2300	02–03d	4	Mu, Mi
37	29	3	1970	Mu	0539–0619	29–31d	20	Mu, Mi
38	24	1	1971	Mi	25d0810	25–27d	21	Mu, Mi
39	1	9	1971	Mi	02d0820	02–04d	17	Mu, Mi
40	4	8	1972	Mi	0758–0832	4–7d	30	Mu, Mi
41	7	8	1972	Mi	8d0404–0429	8d	8	Mu, Mi
42	29	4	1973	Mi	30d0830	30–01d	5	Mu, Mi
43	23	9	1974	Mu	24d0658–0958	24–26d	13	Mu
44	30	4	1976	Mi	01d0820	01d	1	Mi
45	19	9	1977	Mu	1101–1150	19–20d	16	Mu, Mi
46	24	9	1977	Mu	0747–0839	24–25d	19	Mu, Mi
47	22	11	1977	Mi	1620–1716	22–24d	7	Mi
48	28	4	1978	Mu	29d0630–0714	29–30d	12	Mu, Mi
49	7	5	1978	Mu	0613–0702	7–8d	18	Mu, Mi
50	23	9	1978	Mu	1206–1335	23–25d	11	Mu, Mi
51	18	8	1979	Mi	20d0355–0407	20–21d	7	Mu, Mi
52	21	8	1979	Mi	0823–0853	21d	5	Mu, Mi
53	14	9	1979	Mu	16d0703–0715	16–20d	16	Mu, Mi
54	1	4	1981	Mu	0655–0709	1d	2	Mu
55	4	4	1981	Mu	0728–0747	4d	6	Mu, Mi
56	10	4	1981	Mu	1820–1856	10–11d	10	Mu, Mi
57	30	4	1981	Mi	0859–0925	30–01d	8	Mu, Mi
58	10	5	1981	Mi	0849–1058	10–11d	8	Mu, Mi
59	7	10	1981	Mu	08d0031–0045	08–11d	39	Mu, Mi
60	12	10	1981	Mu	0647–0706	12–15d	48	Mu, Mi
61	12	7	1982	Mu	13d0757–0806	13–15d	4	Mu
62	26	11	1982	Mu	0615–0724	26d	7	Mu, Mi
63	8	12	1982	Mi	0730–0820	08–09d	10	Mu, Mi

Table 1 (*continued*)

#	Day	Month	Year	Site of the first observation	Time of the first observation, UT	Whole time of observations in the stratosphere	Number of balloon launches	Sites of observations
64	17	12	1982	Mu	18d0623–0705	18d	4	Mu
65	16	2	1984	Mu	0709–0715	16–19d	5	Mu, Mi
66	14	3	1984	Mu	0608–0703	14d	3	Mu, Mi
67	25	4	1984	Mu	26d0627–0657	26–28d	11	Mu, Mi
68	14	12	1988	Mu	15d0728–0842	15–16d	4	Mu
69	16	12	1988	Mi	1059–1156	16–18d	12	Mu, Mi
70	25	7	1989	Missed				
71	12	8	1989	Mu	13d0512–0605	13–15d	15	Mu, Mi
72	16	8	1989	Mu	0641–0805	16d	6	Mu, Mi
73	17	8	1989	Mu	0309–0435	17–19d	8	Mu, Mi
74	29	9	1989	Mu	1521–1708	29–02d	28	Mu
75	19	10	1989	Mu	1651–1741	19–22d	31	Mu, Mi
76	22	10	1989	Mu	1814–1832	22–23d	12	Mu, Mi
77	24	10	1989	Mu	1734–1843	24–27d	15	Mu, Mi
78	15	11	1989	Mi	0726–0844	15d	4	Mu, Mi
79	21	5	1990	Mi	22d0536–0632	22–23d	9	Mu, Mi
80	24	5	1990	Mu	25d0601–0710	25–26d	9	Mu, Mi
81	26	5	1990	Mi	27d0349–0425	27d	2	Mi
82	28	5	1990	Mi	0744–0830	28d	2	Mi
83	23	3	1991	Mi	1236–1248	23–24d	5	Mi
84	4	6	1991	Mi	6d0745–0921	6–8d	11	Mu, Mi
85	11	6	1991	Mu	0643–0744	11–12d	7	Mu, Mi
86	15	6	1991	Mu	2226–2337	15–17d	4	Mu
87	25	6	1992	Missed				
88	2	11	1992	Mu	0634–0734	2–3d	6	Mu, Mi
89	4	11	1997	Missed				
90	6	11	1997	Mo	1317–1448			Mo
91	20	4	1998	Mi	21d0635–0702	21–22d	3	Mi
92	2	5	1998	Mi	3d0740–0804	3d	3	Mi
93	6	5	1998	Mu	1119–1123	6d	1	Mu
94	24	8	1998	Mi	25d0758–0916	25–31d	7	Mu, Mi
95	14	11	1998	Mi	0709–0833	14–16d	6	Mu, Mi
96	14	7	2000	Mu	1450–1650	14–15d	4	Mu
97	12	9	2000	Mu	13d0619–0849	13d	3	Mu
98	8	11	2000	Mi	9d0858–1006	9–10d	9	Mu, Mi
99	2	4	2001	Mi	3d0845–1012	3–4d	4	Mu, Mi
100	15	4	2001	Mi	16d0648–0750	16–17d	3	Mi
101	18	4	2001	Mu	0636–0847	18–19d	6	Mu, Mi
102	16	8	2001	Mi	0735–0823	16–18d	4	Mu, Mi
103	24	9	2001	Mu	1801–1843	24d	1	Mu
104	4	11	2001	Mi	5d0726–0823	5–9d	8	Mu, Mi
105	22	11	2001	Mi	23d0747–0838	23d	3	Mu, Mi
106	26	12	2001	Mu	0710–0845	26–28d	5	Mu, Mi
107	21	4	2002	Mu	22d0842–1018	22d	2	Mu
108	24	8	2002	Mi	0706–0807	24d	4	Mu, Mi
109	26	10	2003	Mu	27d0946–0949	27d	1	Mu
110	28	10	2003	Mu	1637–1740	28–29d	5	Mu
111	29	10	2003	Mu	2251–2415	30–31d	2	Mu
112	2	11	2003	Mu	3d0053–0132	3–4d	6	Mu, Mi
113	4	11	2003	Mi	5d0558–0704	5d	1	Mi
114	17	1	2005	Mi	18d0554–0606	18d	2	Mu, Mi
115	20	1	2005	Mu	0732–0838	20–21d	11	Mu
116	7	9	2005	Mi	8d0901–0951	8–9d	6	Mi
117	5	12	2006	Mi	6d0922–0957	6d	1	Mi
118	6	12	2006	Mu	8d0814–0852	8d	1	Mu
119	13	12	2006	Mu	0824–0912	13–14d	7	Mu, Mi
120	14	12	2006	Mi	16d0841–1150	16d	1	Mi
Doubtful events								
	17	3	1958	Mu	1018–1049	17d	2	Mu
	3	10	1958	Mu	0815–0903	3d	1	Mu
	12	5	1960	Mu	0818–0827	12d	1	Mu
	9	5	1961	Mu	0811–087	5d	2	Mu

* #26 and 27 are two events occurred on 28.01.1968 according to the GLE list (Cliver et al., 1982).