

Swedish National Seismic Network (SNSN)

A short report on recorded earthquakes during the fourth quarter of the year 2002

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January 2003

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Keywords: Seismic network, earthquakes.

This report concerns a study which was conducted for SKB. The conclusions and viewpoints presented in the report are those of the author and do not necessarily coincide with those of the client.

A pdf version of this document can be downloaded from www.skb.se

Abstract

According to an agreement with Swedish Nuclear Fuel and Waste Management Company (SKB) and Uppsala University, the Department of Earth Sciences has continued to carry out observation and additional construction of new seismic stations within the Swedish National Seismic Network (SNSN). This report gives some information about the recorded seismicity during October through December 2002.

At present 38 stations are in operation and seven additional stations will be put into operation during the spring 2003. During the period October through December 2002, there were 59 located events were 2 earthquakes was larger then or of magnitude 3.0. Additional 3 earthquakes have a magnitude larger than 2.0 and additional 11 larger than 1.0. The range of the depth to the location to the center of the generated earthquakes varies between 2.4 and 34.6 km.

Most of the earthquake activity is along the Bothnian Sea Coast in general and on or around the Post Glacial Faults close to Skellefteå in particular. The largest event, with magnitude 3.3, was located approximately 100 km south of Gotland and was felt by many people especially in Blekinge.

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1 Introduction

This is the fourth quarterly report on seismic events recorded by the Swedish National Seismic Network (SNSN) for the year 2002, Figure 1-1. The report includes fundamental information about the seismic events, including origin time and hypocenter location. Information of the source parameters is not included in the present report but is delivered as a separate ASCII-text. This report is a preliminary report including only the automatic and the brief interactive analysis done on the routine bases at SNSN.

Swedish National Seismic Network Dec 2002

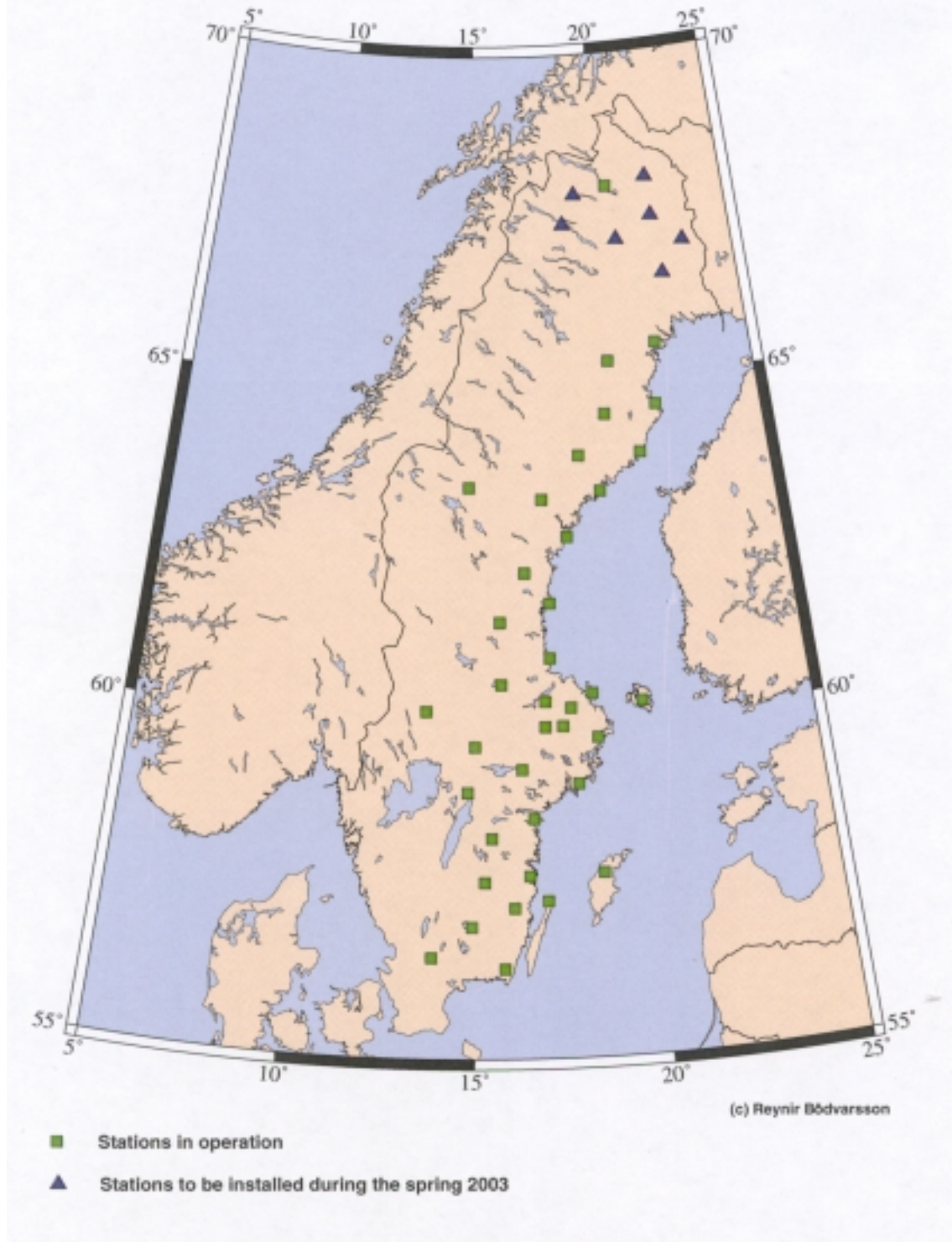


Figure 1-1. The present Swedish National Seismic Network (SNSN).

2 Objective and scope

According to an agreement with Swedish Nuclear Fuel and Waste Management Company (SKB) and Uppsala University, the Department of Earth Sciences continues to carry out observation and additional construction of new seismic stations within the Swedish National Seismic Network (SNSN).

The goal is to complement the existing regional seismic network to establish a local seismic network that also permits registration of small earthquakes in order to obtain relatively long time series and thereby gain a better understanding of the causes of seismic events in the site investigation areas.

Fundamental information about the seismic events, including origin time, hypocenter location and information about the source parameters will be given after every three month period.

Expected results are to obtain information on location, magnitude and source parameters of small earthquakes down to a magnitude of 0.0 near the investigation sites.

3 Recorded earthquakes during the fourth quarter of 2002

At present 38 stations are in operation and seven additional stations will be put into operation during the spring 2003, Figure 1-1. During the period October through December 2002, there were 59 located events were 2 earthquakes was larger then or of magnitude 3.0. Additional 3 earthquakes have magnitude larger than 2.0 and additional 11 larger than 1.0. The range of the depth to the location to the center of the generated earthquakes varies between 2.4 and 34.6 km.

Most of the earthquake activity is along the Bothnian Sea Coast in general and on or around the Post Glacial Faults close to Skellefteå in particular, Figure 3-1. The largest event, with magnitude 3.3, was located approximately 100 km south of Gotland and was felt by many people especially in Blekinge. Macro-seismic investigation has been initiated regarding this earthquake for possible later analysis and comparison with the magnitude 4.3 earthquake south of Karlskrona 1946 in Markus Båth catalogue.

Figure 3-2 shows earthquake activity in Sweden during the whole year of 2002. The event lists for October until December 2002 are given in sections 3.1 through 3.3.

SNSN recorded events October through December 2002

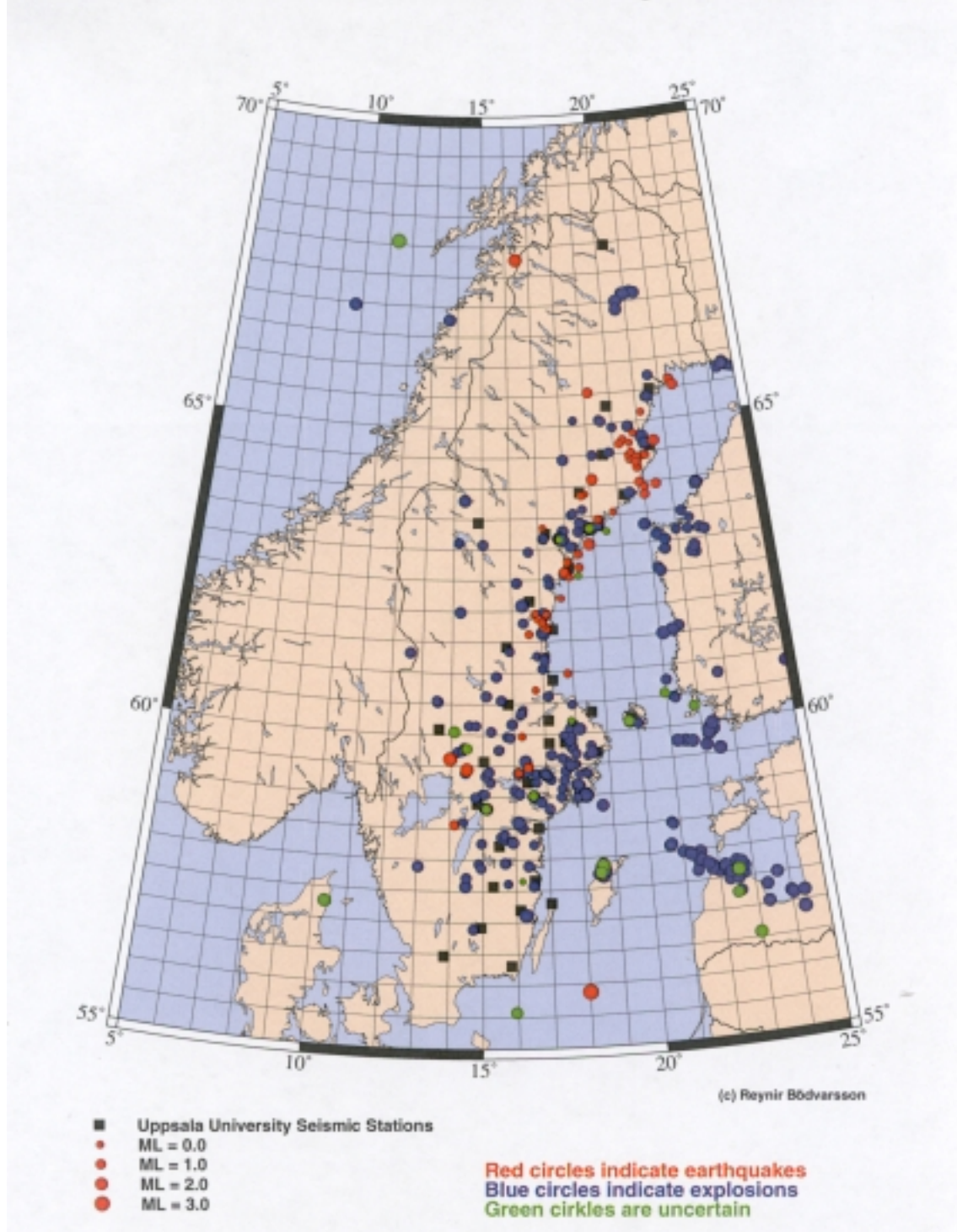


Figure 3-1. Recorded events in the SNSN network during the period October to December 2002.

SNSN recorded events during 2002

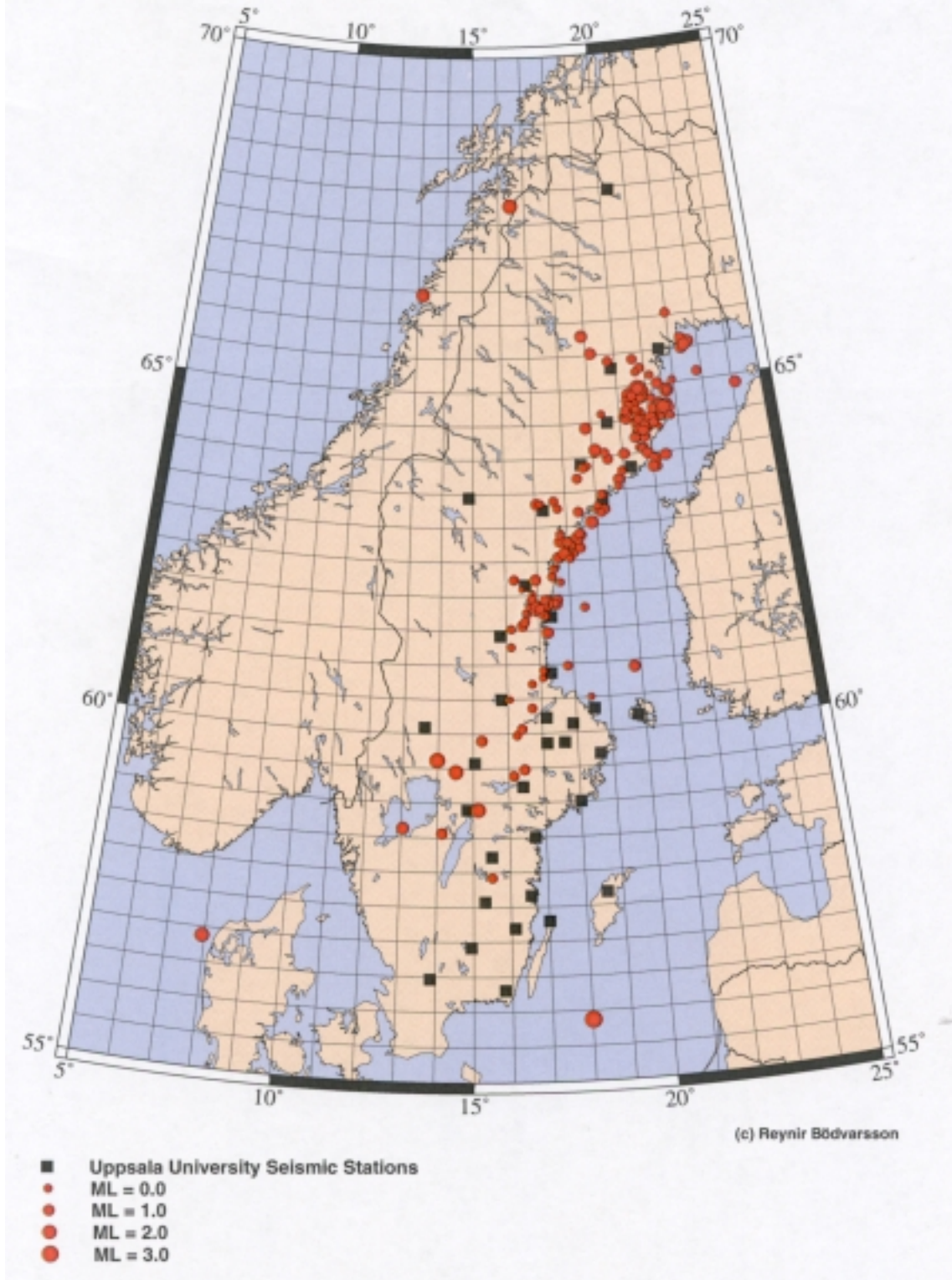


Figure 3-2. Recorded events in the SNSN network during the year 2002.

3.1 October

Event list for October is given in Table 3-1 with date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML). In October 11 events were located whereof 1 with magnitude above 2.0 and additional 2 larger than 1.0. The depth range varies between 2.4 and 13.8 km.

Table 3-1. Date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML) of recorded earthquakes in October.

DATE	TIME	LONGITUDE	LATITUDE	X RT90 63	Y RT90 15	DEPTH Km	ML Local Magnitude
20021002	173540.1	62.188	17.703	6898.5	1598.7	3.7	-0.1
20021003	164401.4	59.442	14.494	6592.0	1425.4	11.3	2.3
20021005	071714.4	61.620	16.564	6834.1	1540.1	11.8	0.4
20021009	163433.8	60.714	16.727	6733.3	1550.1	9.3	0.1
20021012	164734.0	62.674	18.396	6954.0	1632.6	8.6	0.6
20021014	021654.1	62.772	18.007	6964.2	1612.2	6.2	0.6
20021015	112245.2	59.474	16.443	6594.9	1536.0	9.3	0.9
20021020	233632.0	64.097	19.077	7114.0	1659.3	3.7	1.6
20021021	085014.9	64.713	20.354	7186.4	1716.6	13.8	0.5
20021027	163442.5	63.443	19.189	7041.5	1668.6	2.4	0.3
20021030	120509.9	62.605	17.869	6945.4	1605.8	7.9	1.4

3.2 November

Event list for November is given in Table 3-2 with date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML). In November 25 events were located whereof 2 with magnitude above 2.0 and additional 3 larger than 1.0. The depth range varies between 2.6 and 27.6 km.

Table 3-2. Date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML) of recorded earthquakes in November.

DATE	TIME	LONGITUDE	LATITUDE	X RT90 63	Y RT90 15	DEPTH Km	ML Local Magnitude
20021102	151019.9	63.425	19.228	7039.6	1670.7	3.2	-0.1
20021104	032457.8	65.139	21.155	7236.7	1750.7	8.0	0.1
20021105	190342.0	63.428	19.259	7040.0	1672.2	3.0	-0.2
20021108	231336.4	61.863	16.900	6861.4	1557.5	15.3	0.8
20021109	165154.6	63.441	19.187	7041.2	1668.5	3.5	0.4
20021111	142152.9	63.342	17.162	7026.5	1567.8	2.6	-0.2
20021112	025908.2	64.238	20.799	7135.1	1741.9	11.9	0.5
20021112	042627.3	59.971	16.247	6650.3	1524.5	14.4	0.3
20021112	072643.8	60.968	17.806	6762.9	1608.2	7.2	0.4
20021112	084838.2	63.866	18.775	7087.6	1645.8	2.9	-0.1
20021114	052708.0	61.934	16.750	6869.3	1549.4	11.3	-0.3
20021114	061838.8	61.940	17.195	6870.3	1572.8	9.1	0.2
20021115	133525.6	64.328	20.783	7145.1	1740.4	11.3	0.5
20021116	045442.7	64.649	20.212	7178.7	1710.3	22.7	0.5
20021119	124710.4	59.612	13.964	6611.6	1395.9	10.6	2.6
20021121	070302.4	67.773	16.448	7519.9	1527.0	9.0	2.2
20021121	214014.0	63.997	20.839	7108.5	1746.0	15.5	1.1
20021123	152750.1	63.843	18.630	7084.7	1638.8	24.8	0.4
20021125	124221.2	61.702	17.187	6843.7	1572.9	22.1	0.4
20021126	171730.6	64.654	20.585	7180.6	1728.0	21.5	0.1
20021127	223115.0	64.657	21.537	7184.7	1773.4	27.6	1.5
20021128	001008.6	64.809	20.782	7198.6	1736.1	26.2	0.3
20021129	165225.4	58.557	14.119	6493.9	1401.7	12.9	1.1
20021130	210935.1	64.426	21.044	7157.0	1752.0	20.6	0.3
20021130	211311.1	63.549	19.762	7054.9	1696.4	12.4	-0.1

3.3 December

Event list for December is given in Table 3-3 with date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML). In December 23 events were located whereof 2 with magnitude above or of 3.0 and additional 6 larger than 1.0. The depth range varies between 4.4 and 34.6 km.

Table 3-3. Date, time, longitude, latitude, X (RT90), Y (RT90), depth and local magnitude (ML) of recorded earthquakes in December.

DATE	TIME	LONGITUDE	LATITUDE	X RT90 63	Y RT90 15	DEPTH Km	ML Local Magnitude
20021202	183744.1	64.382	20.793	7151.1	1740.4	25.1	0.9
20021204	075819.9	61.957	16.811	6871.9	1552.6	34.6	0.1
20021207	045004.2	61.756	17.059	6849.7	1566.1	7.2	0.5
20021207	171926.1	62.889	18.398	6978.0	1631.7	8.4	0.5
20021207	204519.7	65.637	22.391	7297.5	1802.6	6.8	0.9
20021208	023132.4	64.406	20.815	7153.9	1741.2	26.3	0.8
20021208	075320.0	63.921	21.021	7100.8	1755.5	16.6	0.2
20021208	135939.9	64.380	20.568	7150.1	1729.5	23.8	0.6
20021212	022317.7	65.522	19.153	7272.9	1654.6	4.4	1.2
20021212	084119.6	64.335	20.784	7145.8	1740.3	25.5	0.8
20021213	012253.4	52.213	20.503	5796.9	1820.8	11.1	1.4
20021213	042406.2	51.846	15.165	5745.8	1455.6	9.7	3.0
20021214	032446.9	64.455	20.508	7158.2	1726.0	16.2	0.1
20021217	054505.1	64.434	21.154	7158.4	1757.2	26.8	0.4
20021217	110938.7	64.505	20.626	7164.2	1731.3	10.8	0.1
20021217	165602.2	59.384	16.136	6584.8	1518.6	20.3	0.7
20021218	105945.9	63.043	18.805	6996.0	1651.6	12.6	1.8
20021218	211419.8	55.864	17.999	6195.0	1637.1	5.0	3.3
20021219	231825.2	62.524	18.046	6936.6	1615.2	21.5	0.1
20021220	041635.4	61.815	17.045	6856.3	1565.2	16.2	0.2
20021222	030112.1	65.535	22.507	7286.7	1809.2	11.7	1.4
20021228	013952.8	63.796	20.976	7086.6	1754.5	8.4	1.1
20021230	194045.3	63.948	21.433	7105.5	1775.4	5.4	1.0