Review of observation blacklists at JMA

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Outline

- Blacklists used for JRA-55
  - Conventional data
  - AMVs
  - Satellite radiances
  - No blacklists for statterometer and GNSS-RO at present
- Examples
  - MSU channel 2
  - SSM/I channel 3

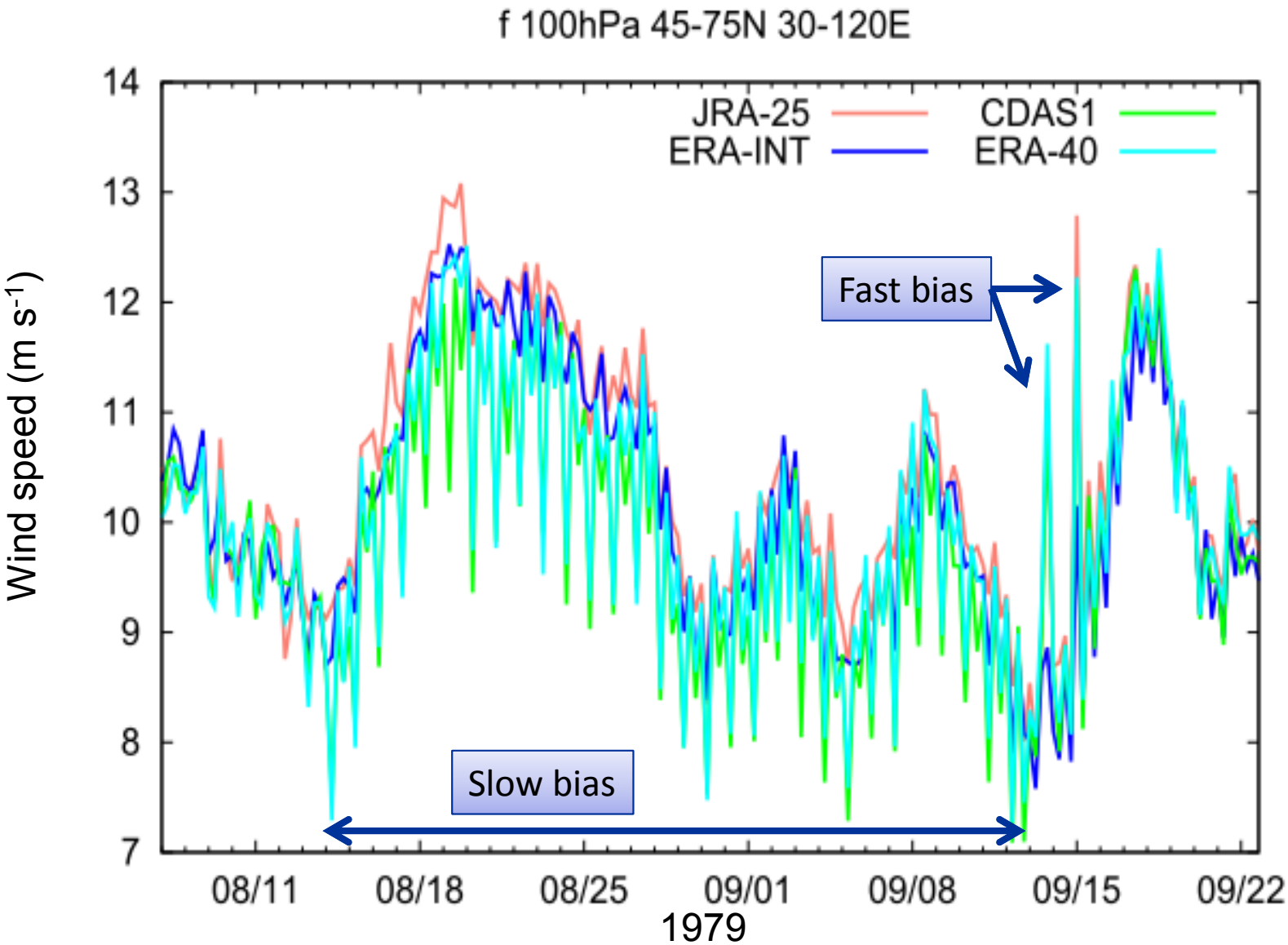
Blacklists for conventional data (1)

- Selection based on
  - Type, station ID (or call sign), element and period (YYYYMMDD)
- Origin of decisions
  - Quality monitoring in the operational NWP system
  - Experiences in previous reanalyses
  - Preliminary screening streams
  - Quality monitoring during production
- In addition, corrections are attempted wherever possible.

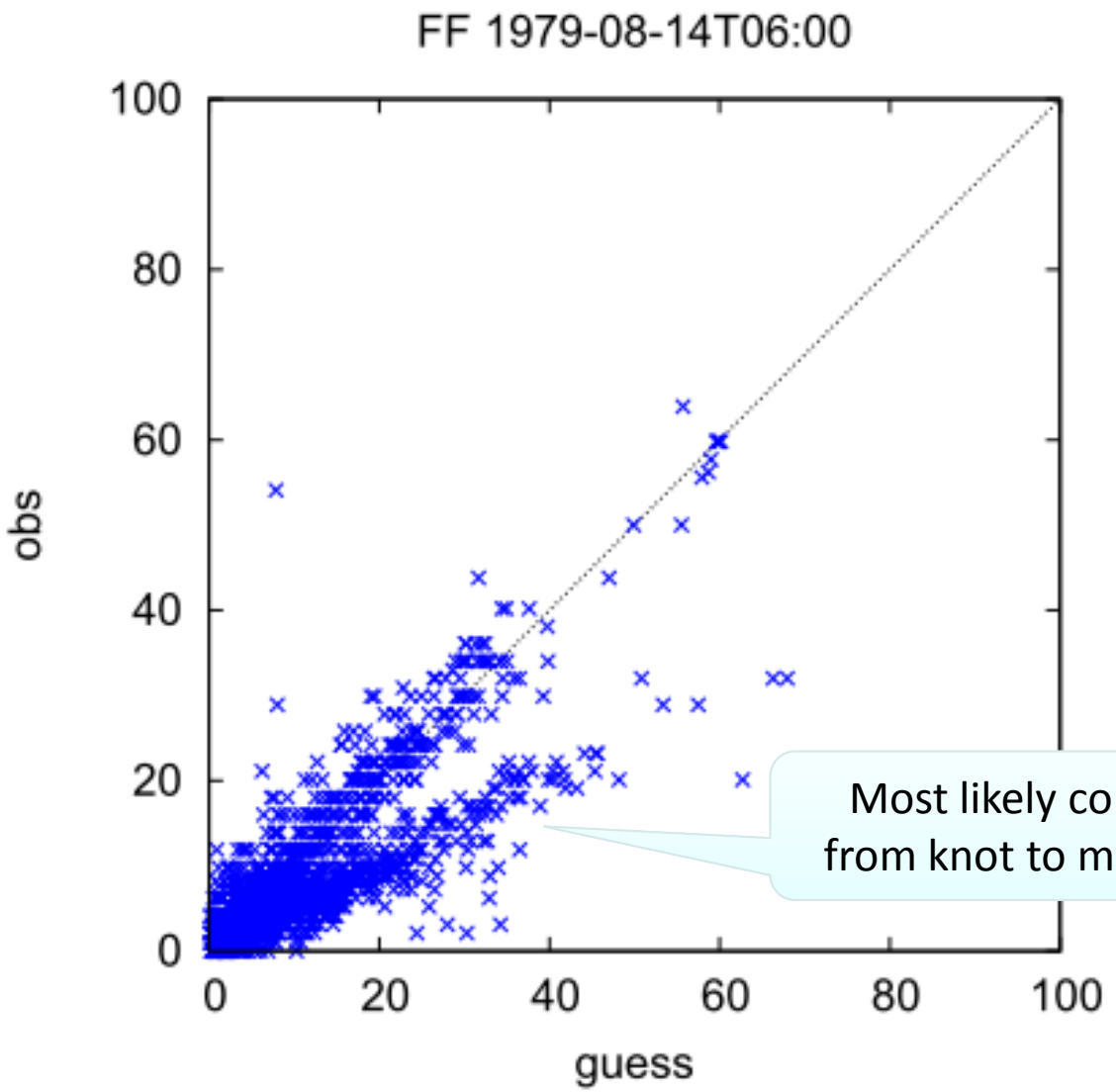
Blacklists for conventional data (2)
Number of events: 1958/01-2002/08 (1958/01-2014/08)

- SYNOP: 1,640 (3,812) periods
  - Including 660 to exclude p_s in the Amazon basin (due to JRA-55 specific problem)
- Moored buoys: 18 (194)
- SHIP: 159 (12,010)
- Drifting buoys: 2,113 (5,995)
- TEMP, PILOT: 467 (1,836)
  - Including 353 to exclude p_s in the Amazon basin (due to JRA-55 specific problem)
- Aircrafts: 1 (2,463)
- Wind profilers: 0 (74)

Example of correction
100 hPa wind over Russia in summer 1979

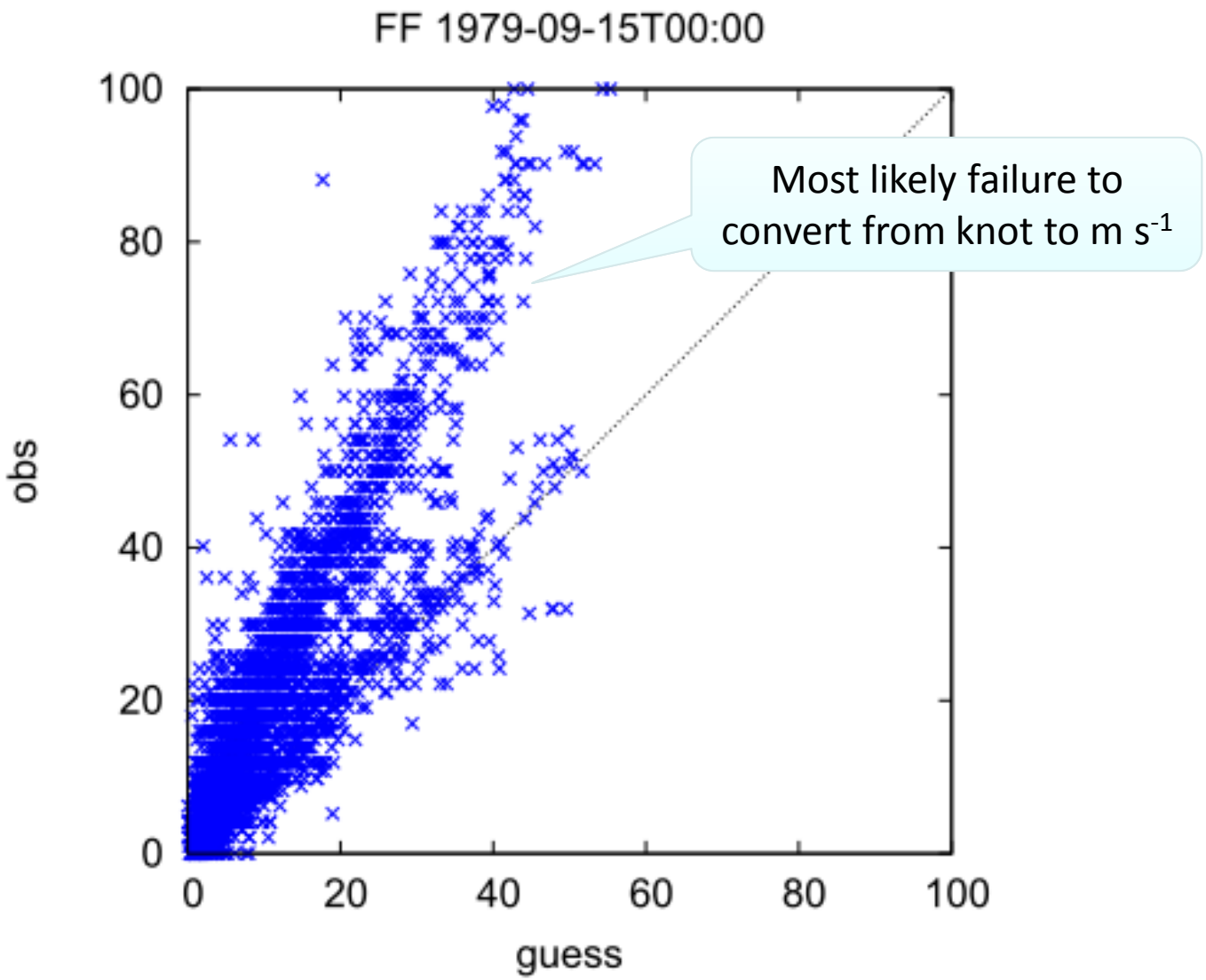


Example of correction
Radiosonde winds over Russia on 19790814, 06UTC

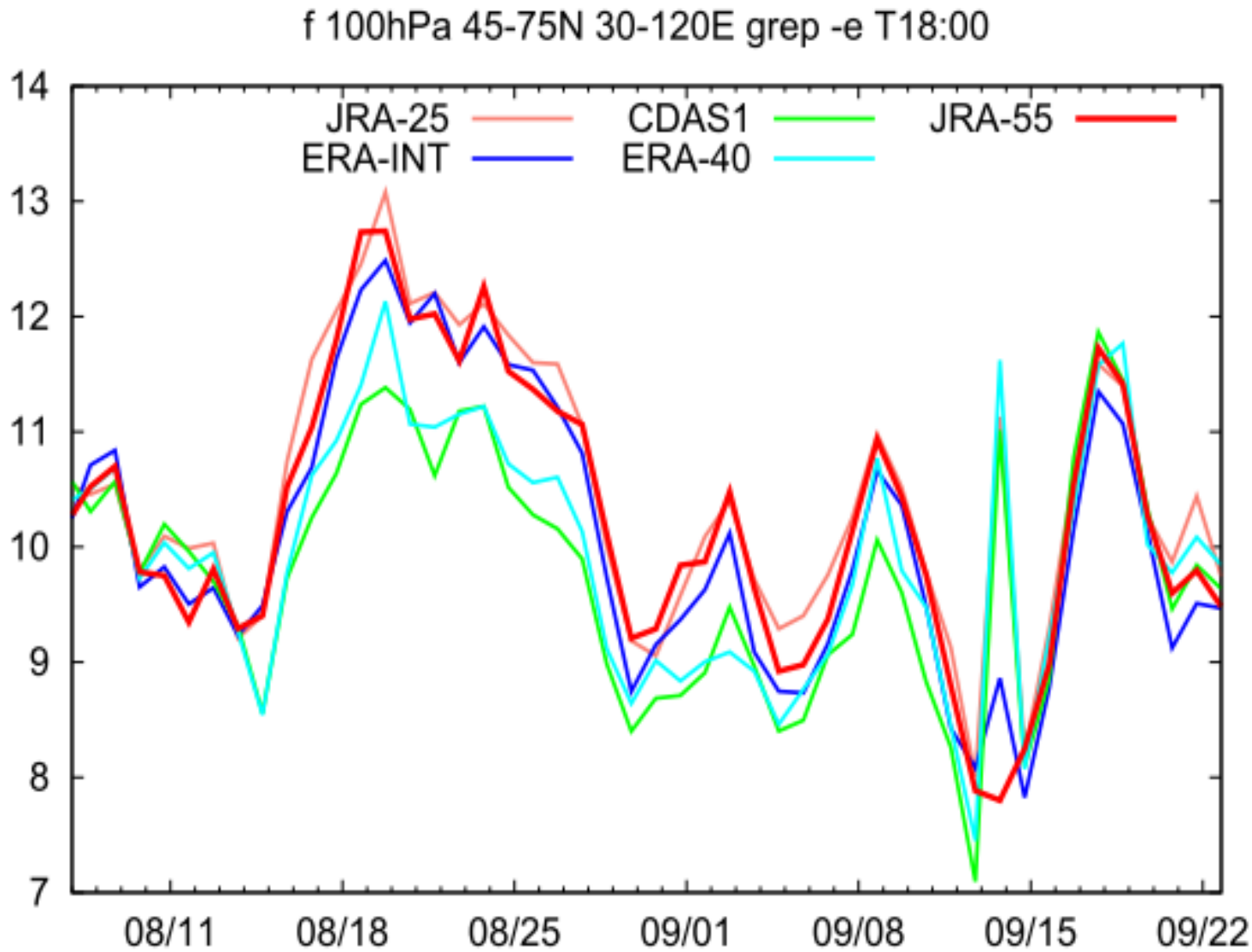


Most likely converted from knot to m s^{-1} twice

Example of correction
Radiosonde winds over Russia on 19790915, 00UTC



Example of correction
100 hPa wind over Russia in summer 1979 (18 UTC only)



Blacklists for AMVs

- Selection based on
  - Satellite, generating centre, derivation method, region and period (YYYYMMDD HH)
- Origin of decisions
  - Information from satellite data providers
  - Results of data assimilation experiments
    - Rather data selection rules than blacklists.
    - Could depend on the data assimilation system used.
- Contents (as of Aug 2014)
  - 13 periods for GEO and 8 periods for LEO after the year 2003
  - Before that, the data were controlled by the input list, meaning no blacklisted data in feedback files.

Blacklists for satellite radiances (1)

- Selection based on
  - Satellite, generating centre, instrument, channel, FOV, region, height, period (YYYYMMDD HHmm)
- Origin of decisions
  - Information from satellite data providers
    - ESPC Notifications
    - NOAA polar orbiter data user's guide, appendix D
    - NOAA KLM user's guide, appendix G
    - EUMETSAT satellites history (EUM/OPS/DOC/08/4698)
  - Quality monitoring in the operational NWP system
  - Experiences in previous reanalyses
  - Preliminary screening streams
  - Quality monitoring during production

Blacklists for satellite radiances (2) Number of events (as of Aug 2014)

- Infrared sounders
  - VTPR (53 periods)
  - HIRS (841 including 679 possible lunar contaminations)
  - SSU (31)
- Microwave sounders
  - MSU (37)
  - AMSU-A (57), AMSU-B (8), MHS (23)
- Microwave imagers
  - SSM/I (200 including 196 FOV-wise blacklists)
  - TMI (2), AMSR (1), SSMIS (116)
- Geostationary satellites
  - GOES (15), MVIRI (29), SEVIRI (12), GMS/MTSAT (13)

Example: MSU channel 2
Input list

#	Sensor	[Start , End]
5	msu	[1978-11-05, 1979-06-25]
6	msu	[1979-07-20, 1983-04-16]
		[1985-11-01, 1986-10-31]
7	msu	[1981-07-16, 1985-02-18]
8	msu	[1983-04-26, 1984-05-31]
9	msu	[1985-01-04, 1988-11-07]
10	msu	[1987-01-01, 1991-09-15]
11	msu	[1988-10-17, 1994-12-31]
		[1997-07-16, 1999-02-25]
12	msu	[1991-07-01, 1997-05-23]
14	msu	[1995-04-10, 2000-12-31]

Example: MSU channel 2 Blacklists (1)

#	Sensor	Ch	FOV	Ctr	Start	End	
5	msu	99999	999	999	197811160000	197811160730	bad earth location
5	msu	99999	999	999	197901020000	197901020200	bad earth location
5	msu	99999	999	999	198003070300	198003080800	bad earth location
5	msu	99999	999	999	198009241830	198009250210	bad earth location
6	msu	99999	999	999	198001010000	198001010030	bad earth location
6	msu	99999	999	999	198001090020	198001090120	bad earth location
6	msu	99999	999	999	198003020420	198003031810	bad earth location
6	msu	99999	999	999	198003031920	198003040010	bad earth location
6	msu	99999	999	999	198011240625	198011242150	bad earth location
6	msu	99999	999	999	198210052300	198210060040	bad earth location
6	msu	99999	999	999	198601010125	198601010500	bad earth location
6	msu	99999	999	999	198601010830	198601020620	bad earth location
6	msu	99999	999	999	198601021009	198601021325	bad earth location
6	msu	99999	999	999	197909060900	197909061500	ERA-40 Project Report Series No. 16
7	msu	99999	999	999	198403012100	198403020900	ERA-40 Project Report Series No. 16
7	msu	99999	999	999	198407210900	198407211500	ERA-40 Project Report Series No. 16
7	msu	99999	999	999	198502072100	198502080900	ERA-40 Project Report Series No. 16
9	msu	99999	999	999	198601010000	198601011120	bad earth location
9	msu	99999	999	999	198601011230	198601011925	bad earth location
9	msu	99999	999	999	198601012045	198601012101	bad earth location

Example: MSU channel 2 Blacklists (2)

9	msu	99999	999	999	198601012155	198601021730	bad earth location
9	msu	99999	999	999	198701010030	198701020220	bad earth location
9	msu	99999	999	999	198801010000	198801050400	bad earth location
9	msu	2	999	999	198703062100		NOAA Polar Orbiter Data User's Guide
10	msu	99999	999	999	198801010000	198801050600	bad earth location
10	msu	99999	999	999	198808070355	198808070535	bad earth location
10	msu	99999	999	999	198710120900	198710121500	ERA-40 Project Report Series No. 16
11	msu	99999	999	999	199307070300	199307070900	ERA-40 Project Report Series No. 16
12	msu	99999	999	999	199407272110	199407272249	NOAA Polar Orbiter Data User's Guide
12	msu	99999	999	999	199307072100	199307092100	ERA-40 Project Report Series No. 16
12	msu	99999	999	999	199502282100	199503012100	ERA-40 Project Report Series No. 16
12	msu	99999	999	999	199703240300	199703240900	ERA-40 Project Report Series No. 16
14	msu	99999	999	999	199604292100	199604302100	ERA-40 Project Report Series No. 16
14	msu	99999	999	999	200110182100	200110192100	ERA-40 Project Report Series No. 16

Example: SSM/I channel 3

- Input list

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# |Sensor   |[Start      , End        ]
 8 ssmi      [1987-06-25, 1993-06-27]
10 ssmi      [1991-02-11, 1997-11-14]
11 ssmi      [1991-12-03, 2000-03-28]
13 ssmi      [1995-05-03, 2009-11-19]
14 ssmi      [1997-05-22, 2008-08-24]
15 ssmi      [2000-02-23, 2006-08-10]
```

- Blacklists

```
# |Sensor   |Ch    |FOV|Ctr|Start        |End            |
14 ssmi      99999 999 999 200808240300
```