

# SSM/I Basefile

File Format Specification

Release V1

May 25, 2012

# 1 Introduction

SSM/I Basefiles are files in netCDF version 4.0 format. The filename has the form:

SSMI\_TDRBASE\_VVRRR\_FNN\_DYYYYMMDD\_SHHMM\_EHHMM\_RGGGGG.nc

where:

VVV	-	Algorithm version (e.g. V01)
RRR	-	Revision (e.g. R00)
FNN	-	Satellite Designation (e.g. F15)
DYYYYMMDD	-	Date as year month day
SHHMM	-	Start time as hour minute
EHHMM	-	End time as hour minute
RGGGGG	-	Granule number

An example filename is:

SSMI\_TDRBASE\_V01R01\_F15\_D20060701\_S0122\_E0303\_R33847.nc

# 2 Summary of Data Fields

Dimension definitions:

Name	Size	Description
npixel_lores	64	Number of low res pixels in a scan
npixel_hires	128	Number of high res pixels in a scan
nscan_lores	1607	Number of low res scans
nscan_hires	3214	Number of high res scans
nchan_lores	5	Number of low res channels
nchan_hires	2	Number of high res channels
nload	5	Number of hot/cold load readings per scan
ntime	6	Number of date/time fields
nscpos	2	Number of spacecraft positions reported each scan

Variable definitions:

Name	Type	Dimensions
spacecraft_id	int	1
begin_time	int	ntime
end_time	int	ntime
ascend_time	int	ntime
nscan_lores	int	1
nscan_hires	int	1
begin_orbit	int	1
tle_xtime	double	1
orbit_number	double	nscan_lores
scan_time	float	(nscan_lores, ntime)

lat_lores	float	(nscan_lores, npixel_lores)
lon_lores	float	(nscan_lores, npixel_lores)
ta19v	float	(nscan_lores, npixel_lores)
ta19h	float	(nscan_lores, npixel_lores)
ta22v	float	(nscan_lores, npixel_lores)
ta37v	float	(nscan_lores, npixel_lores)
ta37h	float	(nscan_lores, npixel_lores)
sfctype_lores	int	(nscan_lores, npixel_lores)
qflag_lores	int	(nscan_lores, nchan_lores)
lat_hires	float	(nscan_hires, npixel_hires)
lon_hires	float	(nscan_hires, npixel_hires)
ta85v	float	(nscan_hires, npixel_hires)
ta85h	float	(nscan_hires, npixel_hires)
sfctype_hires	int	(nscan_hires, npixel_hires)
qflag_hires	int	(nscan_hires, nchan_hires)
xtime	double	nscan_lores
spacecraft_time	double	nscan_lores
spacecraft_lat	float	nscan_lores
spacecraft_lon	float	nscan_lores
spacecraft_alt	float	nscan_lores
atime	double	1
spacecraft_posx_gci	double	(nscan_hires, nscpos)
spacecraft_posy_gci	double	(nscan_hires, nscpos)
spacecraft_posz_gci	double	(nscan_hires, nscpos)
spacecraft_velx_gci	double	(nscan_hires, nscpos)
spacecraft_vely_gci	double	(nscan_hires, nscpos)
spacecraft_velz_gci	double	(nscan_hires, nscpos)
autogain1a	float	nscan_lores
autogain2a	float	nscan_lores
autogain3a	float	nscan_lores
autogain1b	float	nscan_lores
autogain2b	float	nscan_lores
autogain3b	float	nscan_lores
rfmxrtemp	float	nscan_lores
forwardradtemp	float	nscan_lores
hotload1	float	nscan_lores
hotload2	float	nscan_lores
hotload3	float	nscan_lores
refvolt1	float	nscan_lores
refvolt2	float	nscan_lores
cold_load_19v	float	(nscan_lores, nload)
hot_load_19v	float	(nscan_lores, nload)
cold_load_19h	float	(nscan_lores, nload)
hot_load_19h	float	(nscan_lores, nload)
cold_load_22v	float	(nscan_lores, nload)
hot_load_22v	float	(nscan_lores, nload)
cold_load_37v	float	(nscan_lores, nload)
hot_load_37v	float	(nscan_lores, nload)

cold_load_37h	float	(nscan_lores, nload)
hot_load_37h	float	(nscan_lores, nload)
cold_load_85va	float	(nscan_lores, nload)
hot_load_85va	float	(nscan_lores, nload)
cold_load_85ha	float	(nscan_lores, nload)
hot_load_85ha	float	(nscan_lores, nload)
cold_load_85vb	float	(nscan_lores, nload)
hot_load_85vb	float	(nscan_lores, nload)
cold_load_85hb	float	(nscan_lores, nload)
hot_load_85hb	float	(nscan_lores, nload)
slope19v	float	nscan_lores
offset19v	float	nscan_lores
slope19h	float	nscan_lores
offset19h	float	nscan_lores
slope22v	float	nscan_lores
offset22v	float	nscan_lores
slope37v	float	nscan_lores
offset37v	float	nscan_lores
slope37h	float	nscan_lores
offset37h	float	nscan_lores
slope85v	float	nscan_lores
offset85v	float	nscan_lores
slope85h	float	nscan_lores
offset85h	float	nscan_lores

### 3 Description of Data Fields

- spacecraft\_id** : Spacecraft ID number from TDR file
- begin\_time** : Start of orbit granule time stored as [0]=year, [1]=month, [2]=day-of-month, [3]=hour, [4]=minute, [5]=second
- end\_time** : End of orbit granule time stored as [0]= year, [1]=month, [2]=day-of-month, [3]=hour, [4]=minute, [5]=second
- ascend\_time** : Time of ascending pass of spacecraft across equator stored as [0]= year, [1]=month, [2]=day-of-month, [3]=hour, [4]=minute, [5]=second
- nscan\_lores** : Number of low resolution scans
- nscan\_hires** : Number of high resolution scans
- begin\_orbit** : Beginning orbit number
- tle\_xtime** : Time of Two Line Element – in seconds from January 1, 1987 – used to

compute spacecraft ephemeris

- orbit\_number** : Fractional orbit number
- scan\_time** : Time stored as [0]= year, [1]=month, [2]=day-of-month, [3]=hour, [4]=minute, [5]=second
- lat\_lores** : Original pixel latitude for low resolution channels, in degrees
- lon\_lores** : Original pixel longitude for low resolution channels, in degrees
- ta19v** : 19.35 GHz V-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- ta19h** : 19.35 GHz H-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- ta22v** : 22.235 GHz V-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- ta37v** : 37.0 GHz V-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- ta37h** : 37.0 GHz H-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- sfctype\_lores** : Surface type for low resolution: 0=Land, 1=Unused, 2=Near Coast, 3=Ice, 4=Possible Ice, 5=Ocean, 6=Coast
- qflag\_lores** : Quality flag for low resolution: 0=good, 1=bad geolocation, 2=bad TAs
- lat\_hires** : Original pixel latitude for high resolution channels, in degrees
- lon\_hires** : Original pixel longitude for high resolution channels, in degrees
- ta85v** : 85.5 GHz V-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- ta85h** : 85.5 GHz H-Pol antenna temperature, in kelvin  
Missing data value is: -9999.9f
- sfctype\_hires** : Surface type for high resolution: 0=Land, 1=Unused, 2=Near Coast, 3=Ice, 4=Possible Ice, 5=Ocean, 6=Coast
- qflag\_hires** : Quality flag for high resolution: 0=good, 1=bad geolocation, 2=bad TAs
- xtime** : Scan start time (UTC) in seconds since 1 January 1987

**spacecraft\_time** : Ephemeris time in seconds since 1 January 1987

**spacecraft\_lat** : Satellite latitude (repeating) from TDR file, in degrees

**spacecraft\_lon** : Satellite longitude (repeating) from TDR file, in degrees

**spacecraft\_alt** : Satellite altitude (repeating) from TDR file, in km

**atime** : Time as ascending node crossing in seconds

**spacecraft\_posx\_gci** : Orbital Position Vector X in Geocentric Inertial Coordinates, in km

**spacecraft\_posy\_gci** : Orbital Position Vector Y in Geocentric Inertial Coordinates, in km

**spacecraft\_posz\_gci** : Orbital Position Vector Z in Geocentric Inertial Coordinates, in km

**spacecraft\_velx\_gci** : Orbital Velocity Vector X in Geocentric Inertial Coordinates, in km/sec

**spacecraft\_vely\_gci** : Orbital Velocity Vector Y in Geocentric Inertial Coordinates, in km/sec

**spacecraft\_velz\_gci** : Orbital Velocity Vector Z in Geocentric Inertial Coordinates, in km/sec

**autogain1a** : Auto gain control setting 1 (scan A) from scan header #1

**autogain2a** : Auto gain control setting 2 (scan A) from scan header #1

**autogain3a** : Auto gain control setting 3 (scan A) from scan header #1

**autogain1b** : Auto gain control setting 1 (scan B) from scan header #1

**autogain2b** : Auto gain control setting 2 (scan B) from scan header #1

**autogain3b** : Auto gain control setting 3 (scan B) from scan header #1

**rfmxrtemp** : RF Mixer temperature in kelvin

**forwardradtemp** : Forward Radiator temperature in kelvin

**hotload1** : Hot Load Thermal Temperature 1 in kelvin

**hotload2** : Hot Load Thermal Temperature 2 in kelvin

**hotload3** : Hot Load Thermal Temperature 3 in kelvin

**refvolt1** : Reference Voltage 1

**refvolt2** : Reference Voltage 2

**cold\_load\_19v** : 19.35 GHz V-Pol Cold Load Reading in counts  
**hot\_load\_19v** : 19.35 GHz V-Pol Hot Load Reading in counts  
**cold\_load\_19h** : 19.35 GHz H-Pol Cold Load Reading in counts  
**hot\_load\_19h** : 19.35 GHz H-Pol Hot Load Reading in counts  
**cold\_load\_22v** : 22.235 GHz V-Pol Cold Load Reading in counts  
**hot\_load\_22v** : 22.235 GHz V-Pol Hot Load Reading in counts  
**cold\_load\_37v** : 37.0 GHz V-Pol Cold Load Reading in counts  
**hot\_load\_37v** : 37.0 GHz V-Pol Hot Load Reading in counts  
**cold\_load\_37h** : 37.0 GHz H-Pol Cold Load Reading in counts  
**hot\_load\_37h** : 37.0 GHz H-Pol Hot Load Reading in counts  
**cold\_load\_85va** : 85.5 GHz V-Pol Cold Load Reading (A-scan) in counts  
**hot\_load\_85va** : 85.5 GHz V-Pol Hot Load Reading (A-scan) in counts  
**cold\_load\_85ha** : 85.5 GHz H-Pol Cold Load Reading (A-scan) in counts  
**hot\_load\_85ha** : 85.5 GHz H-Pol Hot Load Reading (A-scan) in counts  
**cold\_load\_85vb** : 85.5 GHz V-Pol Cold Load Reading (B-scan) in counts  
**hot\_load\_85vb** : 85.5 GHz V-Pol Hot Load Reading (B-scan) in counts  
**cold\_load\_85hb** : 85.5 GHz H-Pol Cold Load Reading (B-scan) in counts  
**hot\_load\_85hb** : 85.5 GHz H-Pol Hot Load Reading (B-scan) in counts  
**slope19v** : 19.35 GHz V-Pol channel slope in degrees/count  
**offset19v** : 19.35 GHz V-Pol channel offset in counts  
**slope19h** : 19.35 GHz H-Pol channel slope in degrees/count  
**offset19h** : 19.35 GHz H-Pol channel offset in counts  
**slope22v** : 22.235 GHz V-Pol channel slope in degrees/count  
**offset22v** : 22.235 GHz V-Pol channel offset in counts

**slope37v** : 37.0 GHz V-Pol channel slope in degrees/count  
**offset37v** : 37.0 GHz V-Pol channel offset in counts  
**slope37h** : 37.0 GHz H-Pol channel slope in degrees/count  
**offset37h** : 37.0 GHz H-Pol channel offset in counts  
**slope85v** : 85.5 GHz V-Pol channel slope in degrees/count  
**offset85v** : 85.5 GHz V-Pol channel offset in counts  
**slope85h** : 85.5 GHz H-Pol channel slope in degrees/count  
**offset85h** : 85.5 GHz H-Pol channel offset in counts