# ABI RGB Composites for AWIPS

*Final as of 19 December 2016; last edited on 5 December 2017*

Simple (Day one)

| Nickname | Red | Green | Blue | Notes |
|---|---|---|---|---|
| Day Cloud Convection | 0.64 µm | 0.64 µm | 10.3 µm (Inv) | Formerly “Visible Visible Infrared” |
| Day Ocean Cloud Convection | 0.86 µm | 0.86 µm | 10.3 µm | Certain sites only |
| Day Cloud Phase Distinction | 10.3 µm (Inv) | 0.64 µm | 1.6 µm | |
| Nighttime Microphysics (Simple) | 3.9 µm | 3.9 µm | 11.2 µm (Inv) | |
| Fire Temperature | 3.9 µm | 2.2 µm | 1.6 µm | CIRA |
| Day Land Cloud | 1.6 µm | 0.86 µm | 0.64 µm | JMA configuration, formerly “Natural Color” |
| Day Land Cloud Fire | 2.2 µm | 0.86 µm | 0.64 µm | |
| Simple Water Vapor | 10.3 µm | 6.2 µm | 7.3 µm | JMA configuration |

Advanced (Day one, but covered in advanced imagery interpretation training)

| Nickname | Red | Green | Blue | Notes |
|---|---|---|---|---|
| Nighttime Microphysics (Advanced) | 12.3 - 10.3 µm | 10.3 - 3.9 µm | 10.3 µm | JMA configuration (v2) |
| Day Convection | 6.2 - 7.3 µm | 3.9 - 10.3 µm | 1.6 - 0.64 µm | JMA configuration; add particle size to rollover tool |
| Air Mass | 6.2 - 7.3 µm | 9.6 - 10.3 µm | 6.2 µm (Inv) | JMA configuration |
| $SO_2$ | 6.9 - 7.3 µm | 10.3 - 8.4 µm | 10.3 µm | |
| Ash | 12.3 - 10.3 µm | 11.2 - 8.4 µm | 10.3 µm | JMA configuration; ranges differ from dust |
| Dust | 12.3 - 10.3 µm | 11.2 - 8.4 µm | 10.3 µm | JMA configuration |
| Differential Water Vapor | 7.3 - 6.2 µm | 7.3 µm | 6.2 µm | JMA configuration |
| Day Snow-Fog | 0.86 µm | 1.6 µm | 3.9 - 10.3 µm | |

# Complete Specifications

## **Simple** (Day one)

**Day Cloud Convection**
Source: Legacy

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 0.64 µm | 1.7 (0.59) | 0 % | 100 % | No |
| 0.64 µm | 1.7 (0.59) | 0 % | 100 % | No |
| 10.3 µm | 1 | 203.0 K (-70.15 ℃) | 323.0 K (49.85 ℃) | Yes |

**Day Ocean Cloud Convection**
Source: JMA/CIMSS/Pacific Region

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 0.86 µm | 1 | 0 % | 120 % | No |
| 0.86 µm | 1 | 0 % | 120 % | No |
| 10.3 µm | 1 | 173.0 K (-100.15 ℃) | 334.0 K (60.85 ℃) | No |

**Day Cloud Phase Distinction**
Source: JMA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 10.3 µm | 1 | 219.62 K (-53.53 ℃) | 280.67 K (7.52 ℃) | Yes |
| 0.64 µm | 1 | 0 % | 78 % | No |
| 1.6 µm | 1 | 1 % | 59 % | No |

**Nighttime Microphysics (Simple)**
Source: Legacy

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 3.9 µm | 1 | 173.0 K (-100.15 ℃) | 334.0 K (60.85 ℃) | No |
| 3.9 µm | 1 | 173.0 K (-100.15 ℃) | 334.0 K (60.85 ℃) | No |
| 11.2 µm | 1 | 173.0 K (-100.15 ℃) | 334.0 K (60.85 ℃) | Yes |

**Fire Temperature**
Source: CIRA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 3.9 µm | 0.4 (2.5) | 273 K (0 ℃) | 333 K (60 ℃) | No |
| 2.2 µm | 1 | 0 % | 100 % | No |
| 1.6 µm | 1 | 0 % | 75 % | No |

**Day Land Cloud**
Source: JMA/EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 1.6 µm | 1 | 0 % | 97.5 % | No |
| 0.86 µm | 1 | 0 % | 108.6 % | No |
| 0.64 µm | 1 | 0 % | 100 % | No |

**Day Land Cloud Fire**
Source: Legacy MODIS

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 2.2 µm | 1 | 0 % | 100% | No |
| 0.86 µm | 1 | 0 % | 100% | No |

| | | | | |
|---|---|---|---|---|
| 0.64 µm | 1 | 0 % | 100% | No |

**Simple Water Vapor**
Source: JMA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 10.3 µm | 0.10 (10) | 202.29 K (-70.86 ℃) | 278.96 K (5.81 ℃) | Yes |
| 6.2 µm | 0.18 (5.5) | 214.66 K (-58.49 ℃) | 242.67 K (-30.48 ℃) | Yes |
| 7.3 µm | 0.18 (5.5) | 245.12 K (-28.03 ℃) | 261.03 K (-12.12 ℃) | Yes |

**Simple Water Vapor**
Source: CIMSS/JMA/Frank Alsheimer

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 10.3 µm | 2.9 (0.35) | 257.26 K (-15.89 ℃) | 278.96 K (5.81 ℃) | Yes, before gamma |
| 6.2 µm | 2.5 (0.4) | 228.07 K (-45.08 ℃) | 242.67 K (-30.48 ℃) | Yes, before gamma |
| 7.3 µm | 2.5 (0.4) | 252.73 K (-20.42 ℃) | 261.03 K (-12.12 ℃) | Yes, before gamma |

## **Advanced** (Day one, but covered in advanced imagery interpretation training)

### Nighttime Microphysics (Advanced)

Source: JMA/ABoM/EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 12.3 - 10.3 µm | 1 | -6.7 K | 2.6 K | No |
| 10.3 - 3.9 µm | 1 | -3.1 K | 5.2 K | No |
| 10.3 µm | 1 | 243.6 K (-29.55 ℃) | 292.6 K (19.45 ℃) | No |

### Day Convection

Source: JMA/EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 6.2 - 7.3 µm | 1 | -35.0 K | 5.0 K | No |
| 3.9 - 10.3 µm | 0.5 (2) | -5.0 K | 60.0 K | No |
| 1.6 - 0.64 µm | 1 | -75 % | 25 % | No |

### Air Mass

Source: JMA/EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 6.2 - 7.3 µm | 1 | -26.2 K | 0.6 K | No |
| 9.6 - 10.3 µm | 1 | -43.2 K | 6.7 K | No |
| 6.2 µm | 1 | 208.5 K (-64.65 ℃) | 243.9 K (-29.25 ℃) | Yes |

### $SO_2$

Source: JMA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 6.9 - 7.3 µm | 1 | -4.0 K | 2.0 K | No |

| | | | | |
|---|---|---|---|---|
| 10.3 - 8.4 µm | 1 | -4.0 K | 5.0 K | No |
| 10.3 µm | 1 | 243.0 K (-30.15 ℃) | 303.0 K (29.85 ℃) | No |

**Ash**
Source: JMA/EUMETSAT

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 12.3 - 10.3 µm | 1 | -6.7 K | 2.6 K | No |
| 11.2 - 8.4 µm | 1 | -6.0 K | 6.3 K | No |
| 10.3 µm | 1 | 243.6 K (-29.55 ℃) | 302.4 K (29.25 ℃) | No |

**Dust**
Source: JMA/EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 12.3 - 10.3 µm | 1 | -6.7 K | 2.6 K | No |
| 11.2 - 8.4 µm | 2.5 (0.4) | -0.5 K | 20.0 K | No |
| 10.3 µm | 1 | 261.2 K (-11.95 ℃) | 288.7 K (15.55 ℃) | No |

**Differential Water Vapor**
Source: JMA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 7.3 - 6.2 µm | 0.29 (3.5) | -3.0 K | 30.0 K | Yes |
| 7.3 µm | 0.4 (2.5) | 213.15 K (-60 ℃) | 278.15 K (5 ℃) | Yes |
| 6.2 µm | 0.4 (2.5) | 208.5 K (-64.65 ℃) | 243.9 K (-29.25 ℃) | Yes |

**Differential Water Vapor**
Source: JMA/CIMSS

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 7.3 - 6.2 µm | 1.8 (0.55) | 10.2 K | 30.0 K | Yes, before gamma |
| 7.3 µm | 1.7 (0.6) | 230.44 K (-42.71 ℃) | 278.15 K (5 ℃) | Yes, before gamma |
| 6.2 µm | 1.7 (0.6) | 217.9 K (-55.25 ℃) | 243.9 K (-29.25 ℃) | Yes, before gamma |

**Fire Power (proposed)**
Source: JMA/CIRA

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 3.9 µm | 1 | 286.78 K (13.63 ℃) | 345.38 K (72.23 ℃) | No |
| 2.2 - 1.6 µm | 1 | -25 % | 50 % | No |
| 0.47 µm | 1 | 30 % | 95 % | No |

**Day Snow-Fog**
Source: EUMETSAT/Lensky and Rosenfeld (2008)

| Band/Difference | Gamma Variable (Correction) | Minimum | Maximum | Inverted? |
|---|---|---|---|---|
| 0.86 µm | 1.7 (0.59) | 0 % | 100 % | No |
| 1.6 µm | 1.7 (0.59) | 0 % | 70 % | No |
| 3.9 - 10.3 µm | 1.7 (0.59) | 0.0 K | 30.0 K | No |