

H2CO from atm16 to HITRAN 2016

1. changes to the target species H2CO

atm16 = HITRAN 2012 = HITRAN 2016 = no change

2. changes to interfering species, in particular water vapor / WV isotopes

CH4: lines in the 2 main mws look incompatible when using HIT16

atm16: 2778.642800 5.197E-22 9.565E-02.06700.078 219.91970.70 = HIT08 !

HIT16: 2778.642480 5.180E-22 9.535E-02.05900.078 219.91970.70 = HIT12 !

atm16: 2781.391200 2.569E-22 7.112E-02.06500.077 157.13880.72 = HIT08 !

2781.391631 1.186E-22 1.712E-01.05300.068 689.87670.64

HIT16: 2781.391261 2.537E-22 7.025E-02.06500.077 157.13880.72 = HIT12 !

2781.391599 1.199E-22 1.731E-01.05300.068 689.87670.64

3. changes to a fit,

RMS much worse: at PortoVelho RMS = from 0.21 to 0.33

4. changes to column or profile,

Little change: mean TC at Porto Velho = from 1.90E16 to 1.93E16 molec/cm2.

5. Recommendations

Use atm16 (=HIT08) for the CH4 lines which are worse in HIT16 (=HIT12). For HCHO, HIT16 can be used (no change).

HCN

1. changes to the target species HCN

HITRAN 2016 = HITRAN 2012 (no change)

2. changes to interfering species, in particular water vapor / WV isotopes

The H₂O lines in HIT16 are different than in HIT12, and lead to much worse RMS !
HIT12 is also better than HIT08, for H₂O lines.

3. changes to a fit,

RMS much worse using HIT16 (or HIT08), due to H₂O lines.

4. changes to column or profile,

The H₂O lines have high impact on HCN columns at humid site of Porto Velho (e.g. 25% higher with HIT12 compared to HIT08)

5. recommendations

For HCN, HIT16 can be used (no change).

For H₂O: HIT12 is much better in these micro-windows (and better than atm16).