

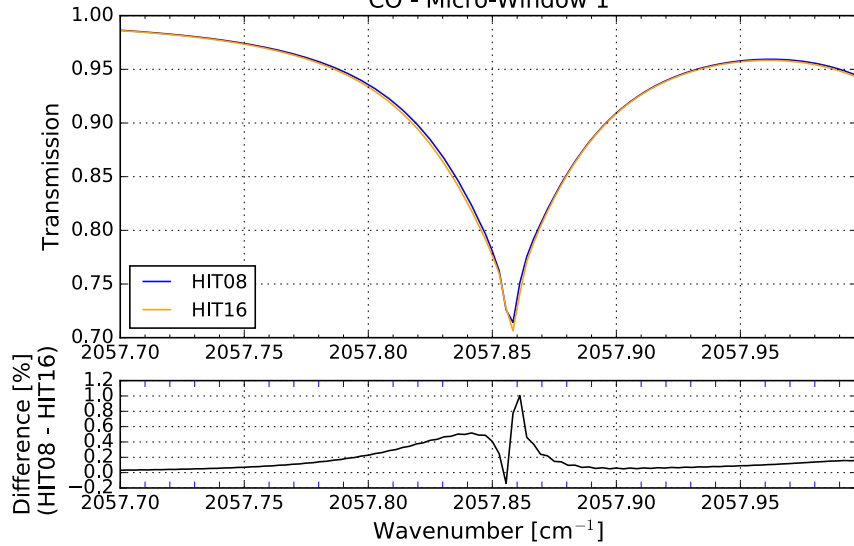
CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

- Simulations
- Retrieval example & comparison
 - HITRAN 08 / HITRAN 16 / ATM 18 (interim list from Geoff ~Dec 2018)
 - Standard IRWG retrieval windows, our typical retrieval setting for archival data.
 - Each interfering species by window with difference then fit then difference in profiles
 - First H08/H16 then H16/A18
 - May 20 SZA 60 Thule
- Correlations
 - Column, fit RMS, DOF
 - 2017 Thule

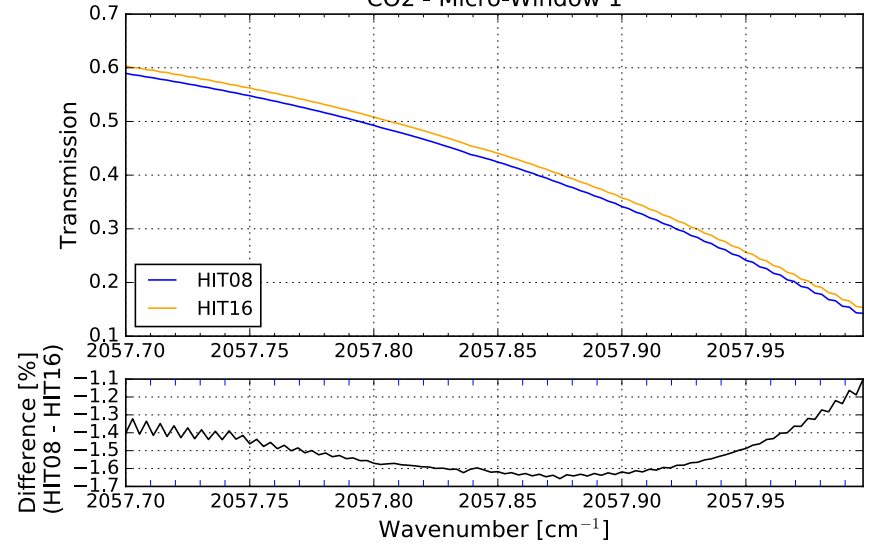
CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

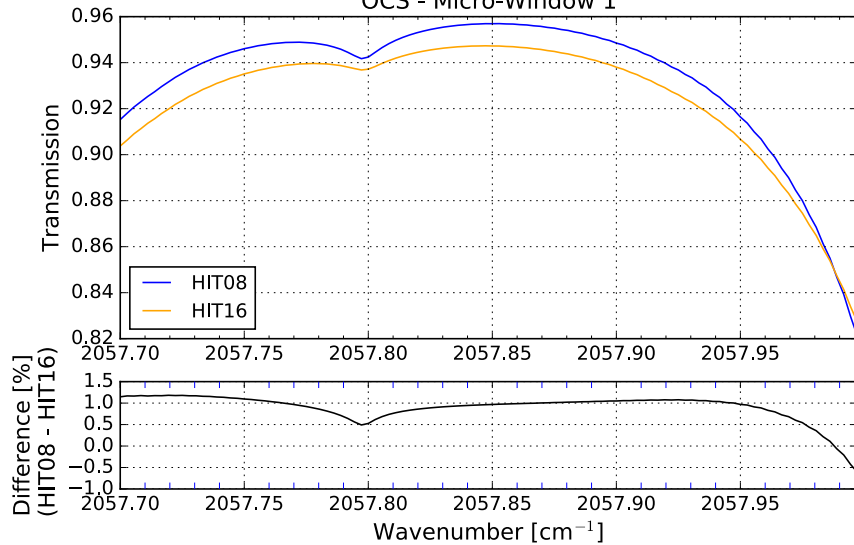
CO - Micro-Window 1



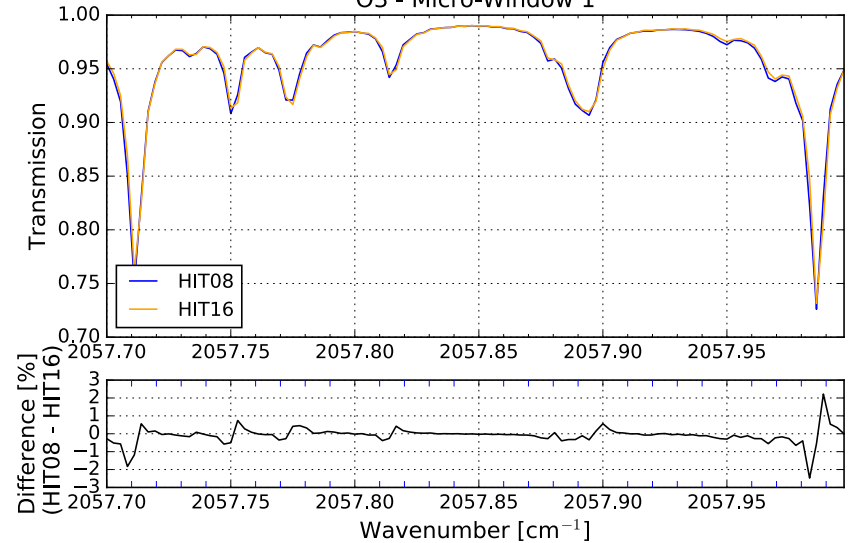
CO2 - Micro-Window 1



OCS - Micro-Window 1



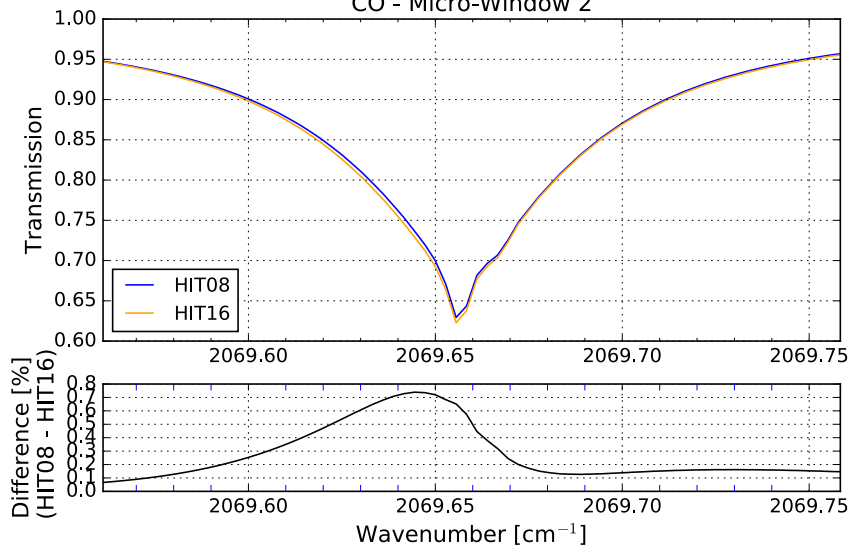
O3 - Micro-Window 1



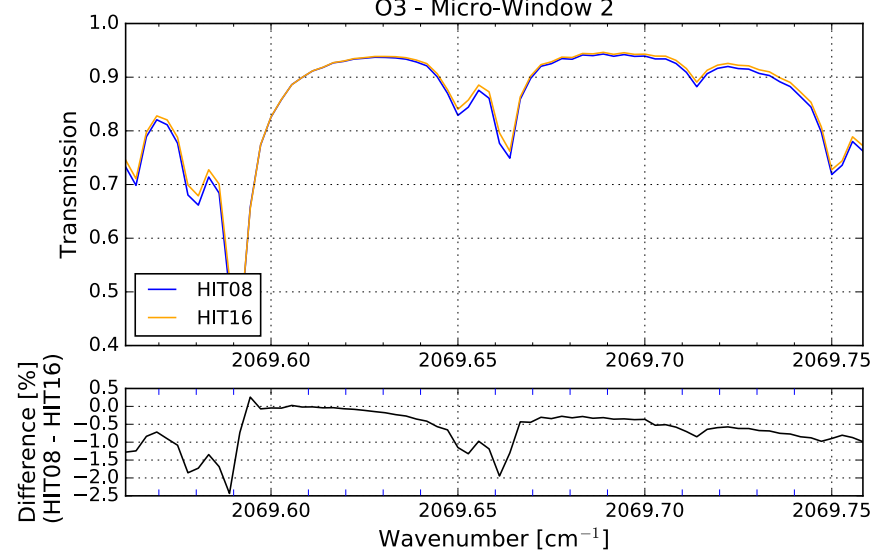
HIT 08 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

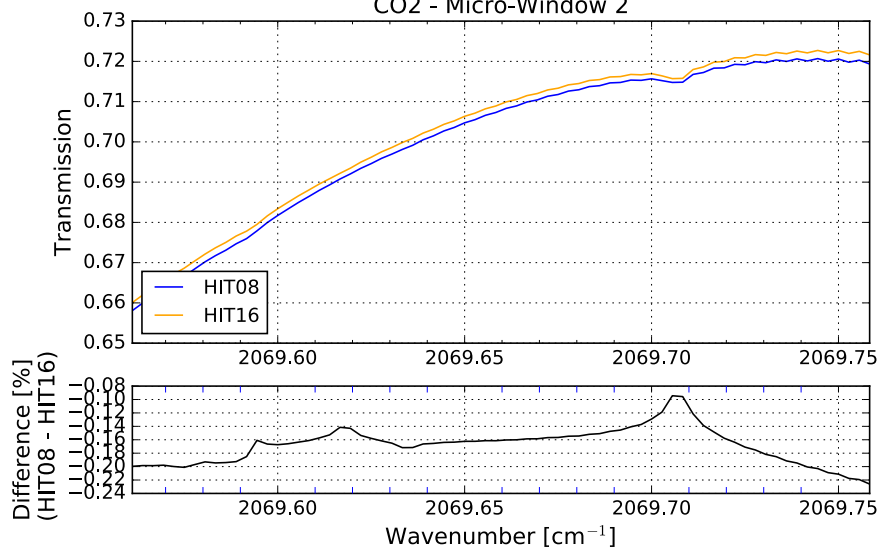
CO - Micro-Window 2



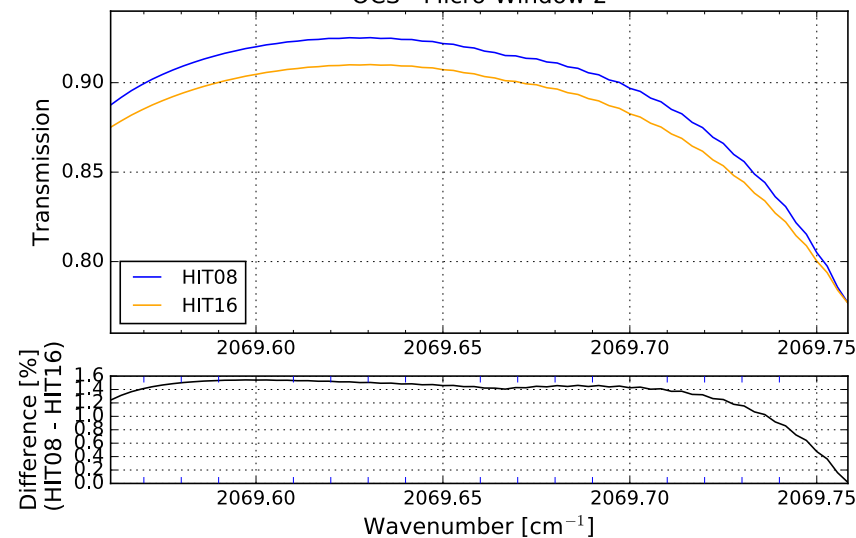
O3 - Micro-Window 2



CO2 - Micro-Window 2

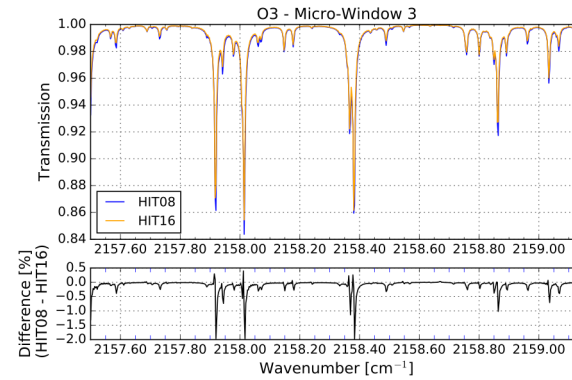
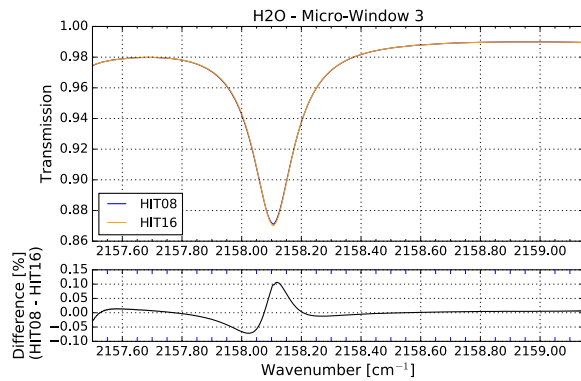
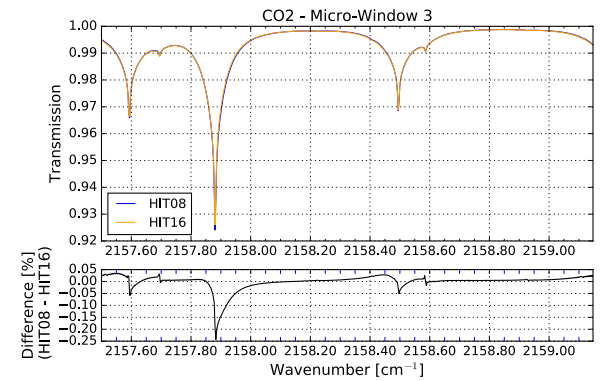
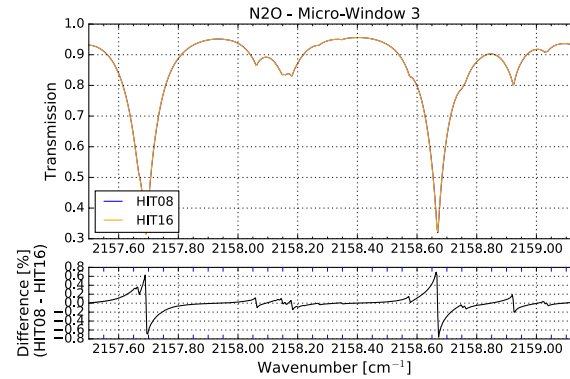
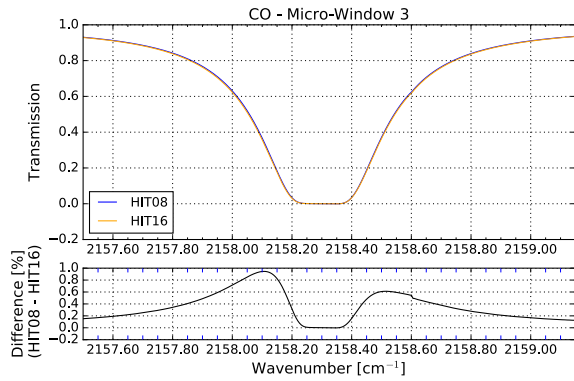


OCS - Micro-Window 2



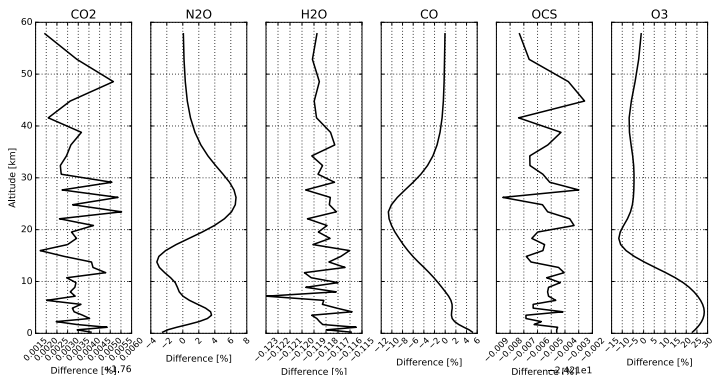
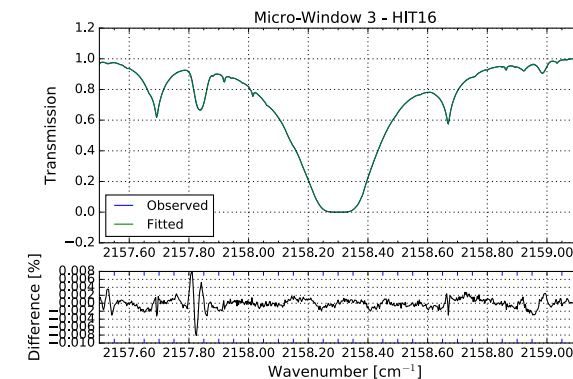
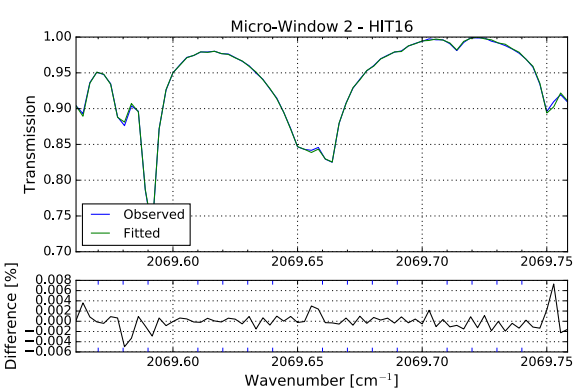
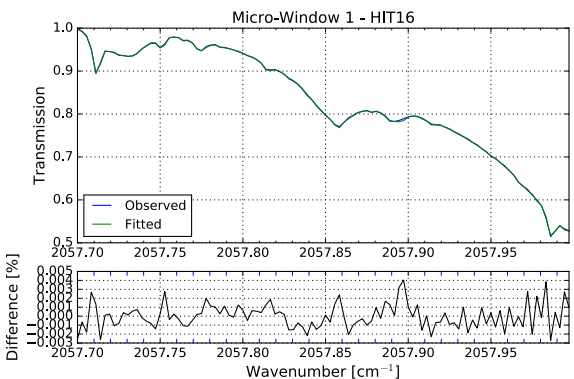
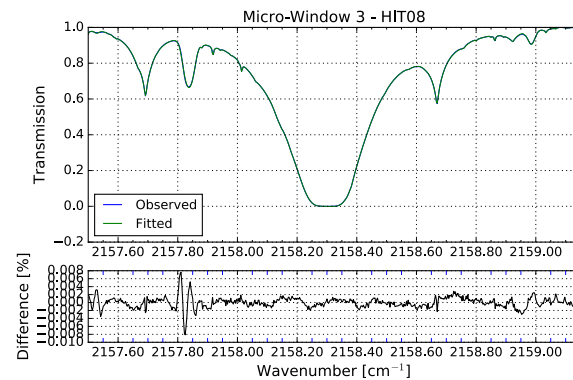
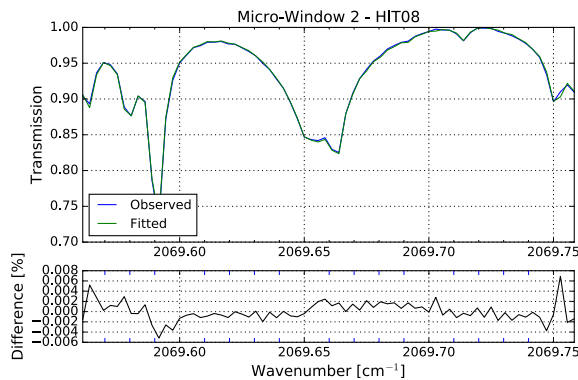
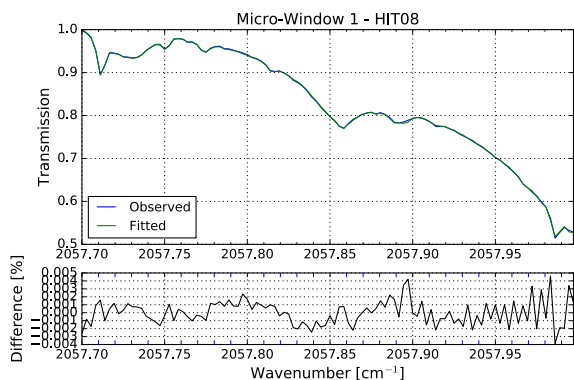
HIT 08 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



HIT 08 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



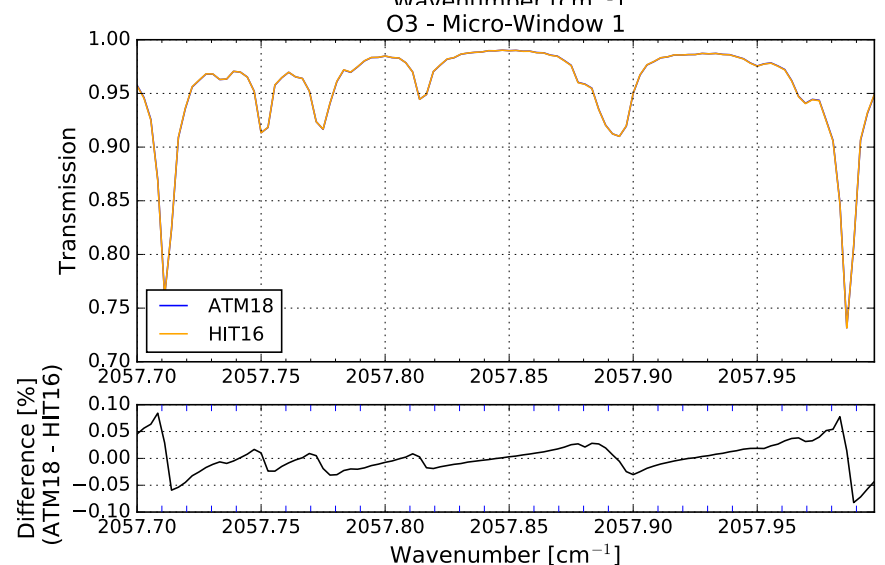
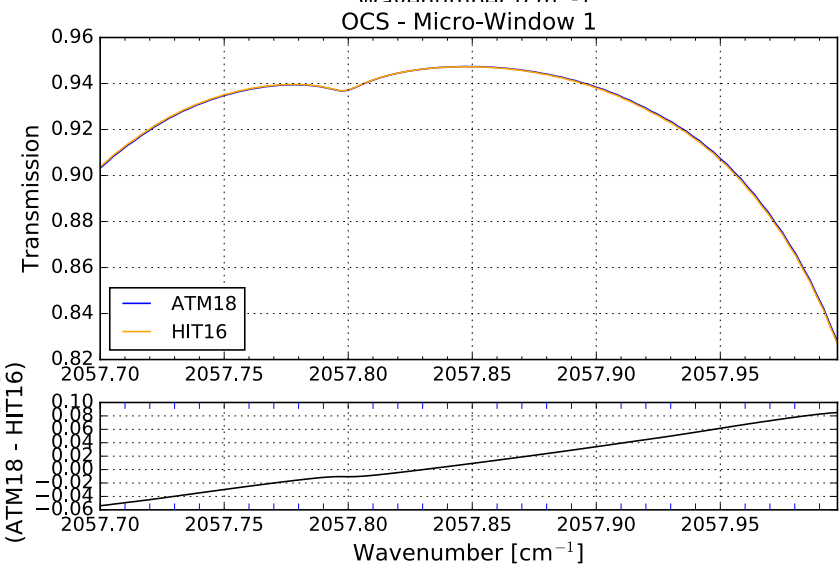
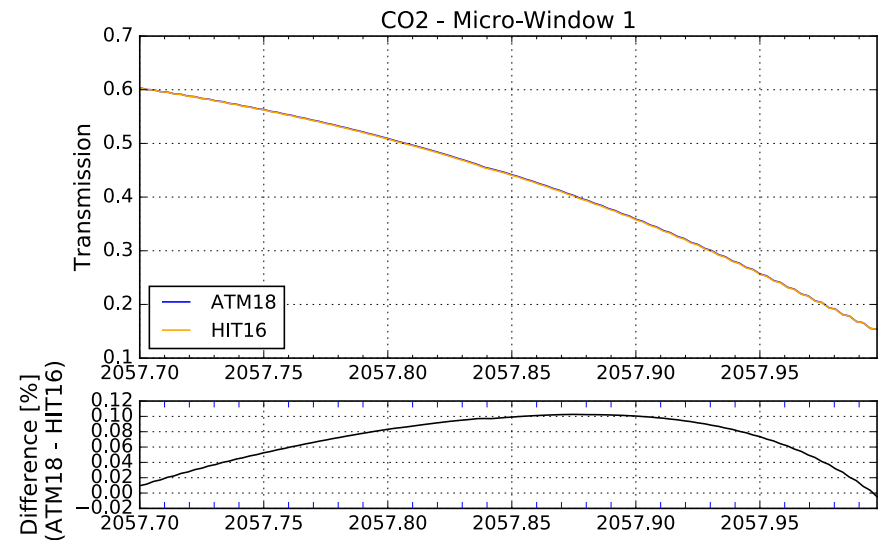
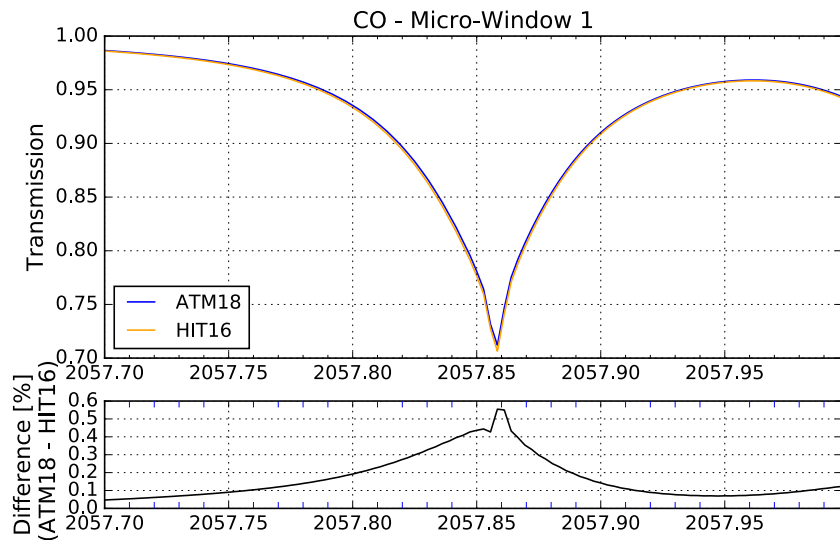
Version = co_HIT08-Ret-2017
 Total Column = 1.71018928331e+18
 rms = 0.190516
 dof = 3.58149439554
 Version = co_HIT16-Ret-2017
 Total Column = 1.68138363103e+18
 rms = 0.188427
 dof = 3.19916137411

Difference of co_HIT08-Ret-2017 - co_HIT16-Ret-2017

Difference [molec/cm²] = 2.88056522759e+16
 Difference [%] = 1.71321117586

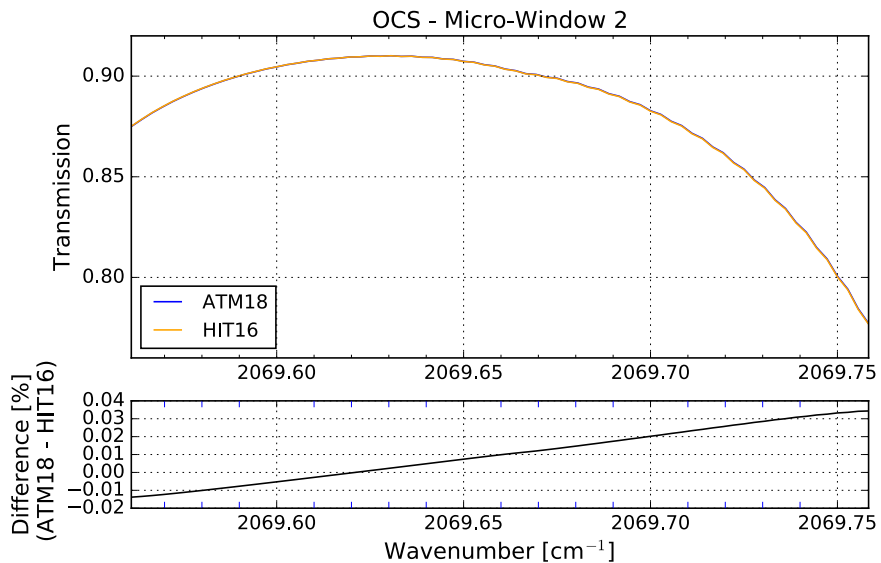
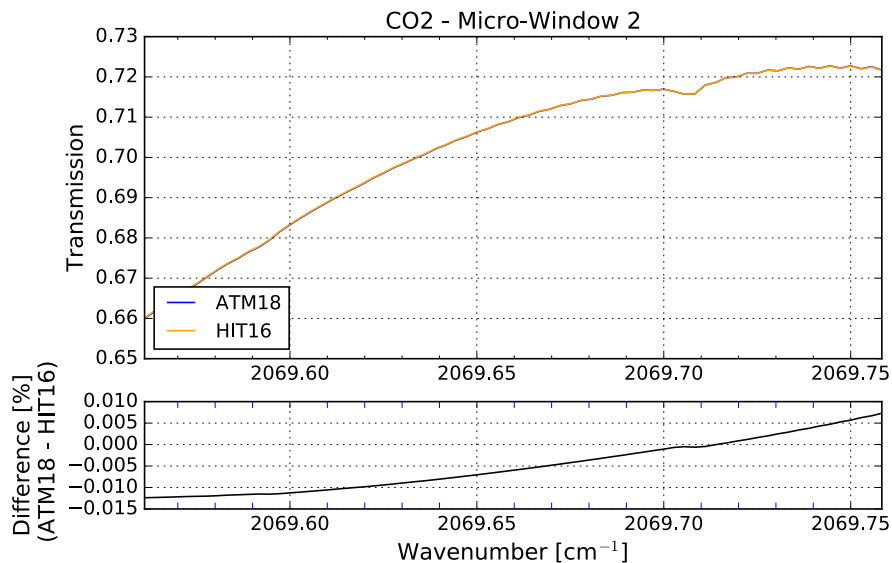
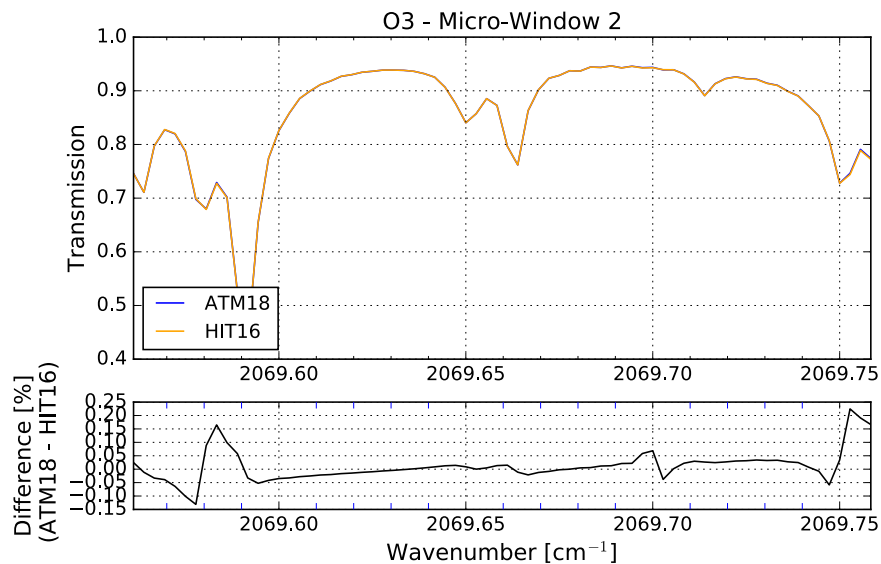
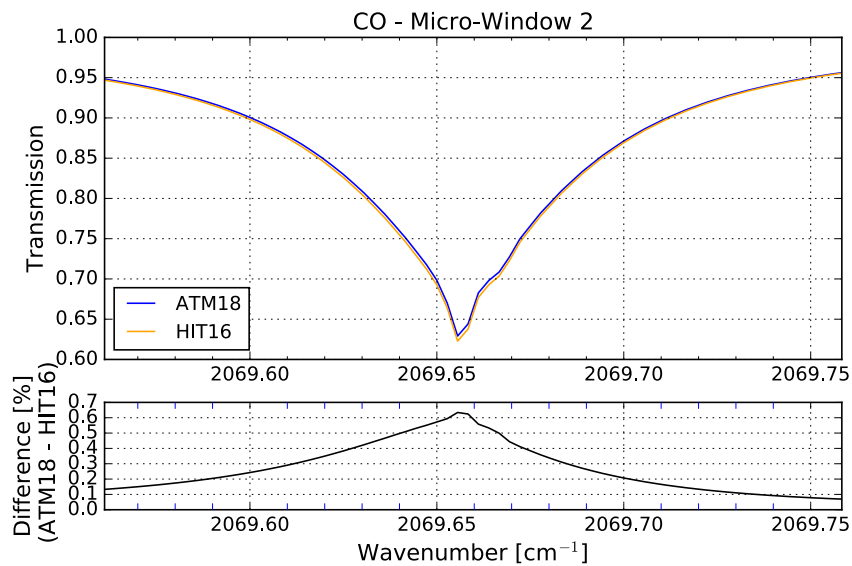
HIT 08 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



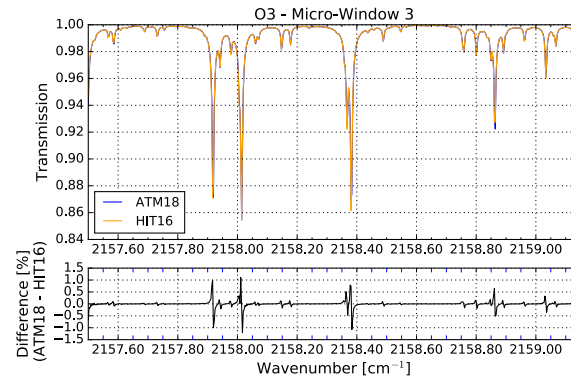
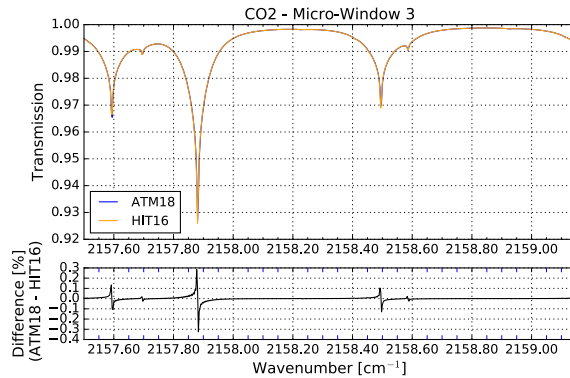
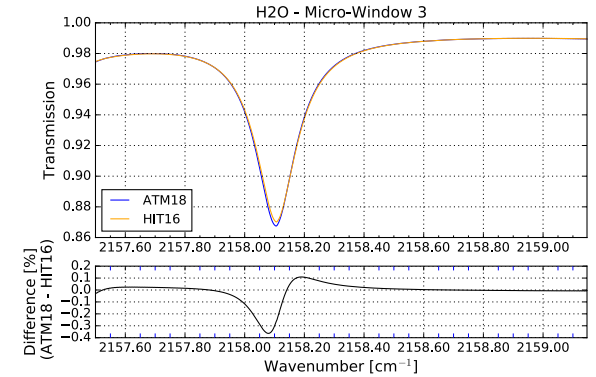
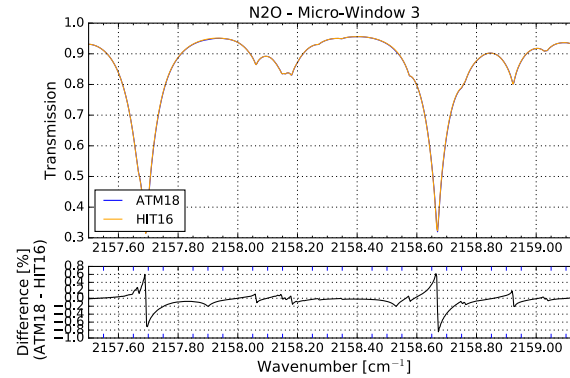
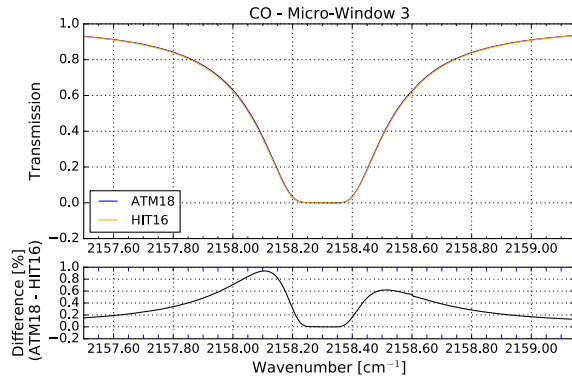
ATM 18 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



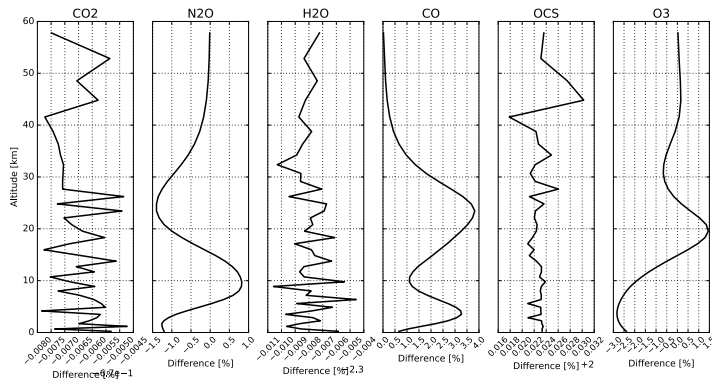
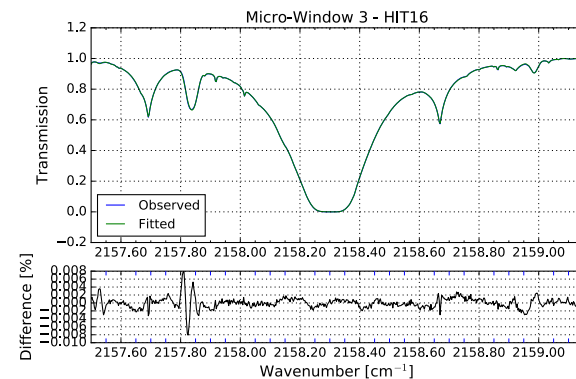
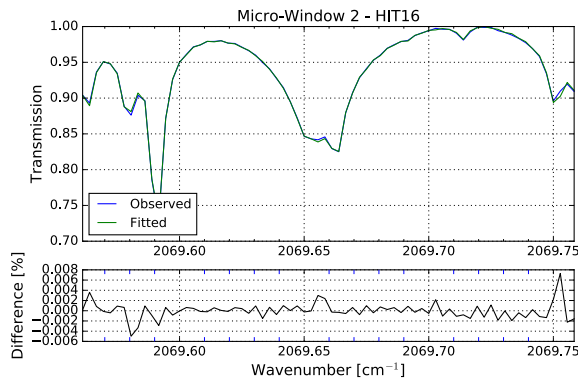
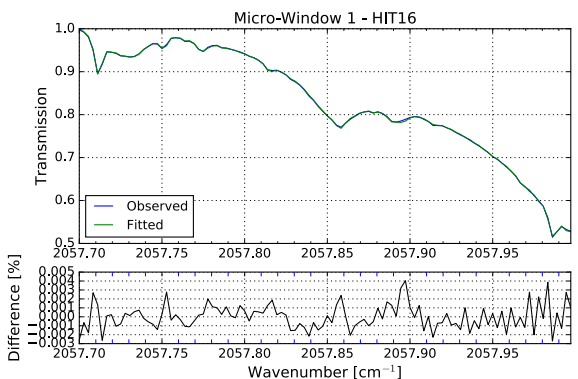
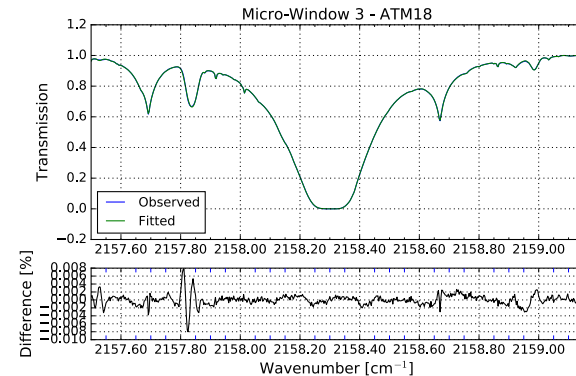
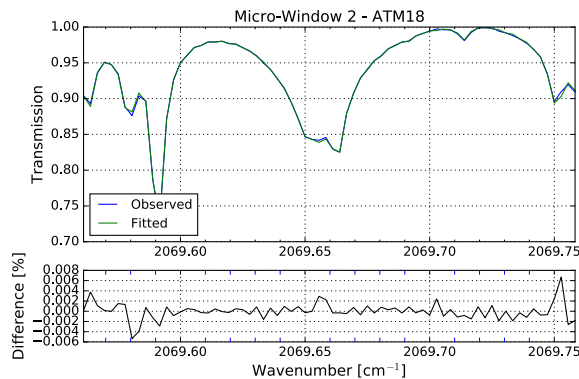
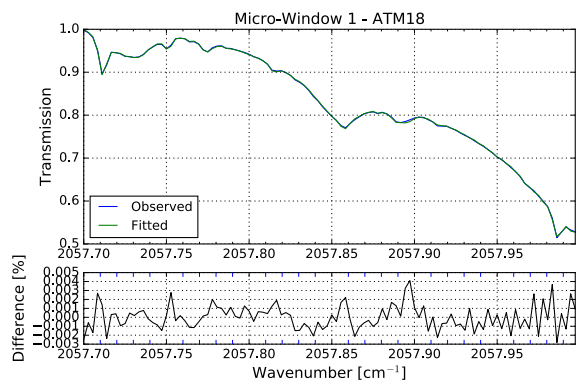
ATM 18 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



ATM 18 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests



Version = co_ATM18-Ret-2017
 Total Column = 1.71786695922e+18
 rms = 0.185046
 dof = 3.1376627093
 Version = co_HIT16-Ret-2017
 Total Column = 1.68138363103e+18
 rms = 0.188427
 dof = 3.19916137411

2.1% increase in column ATM 18 over HIT16 in this case

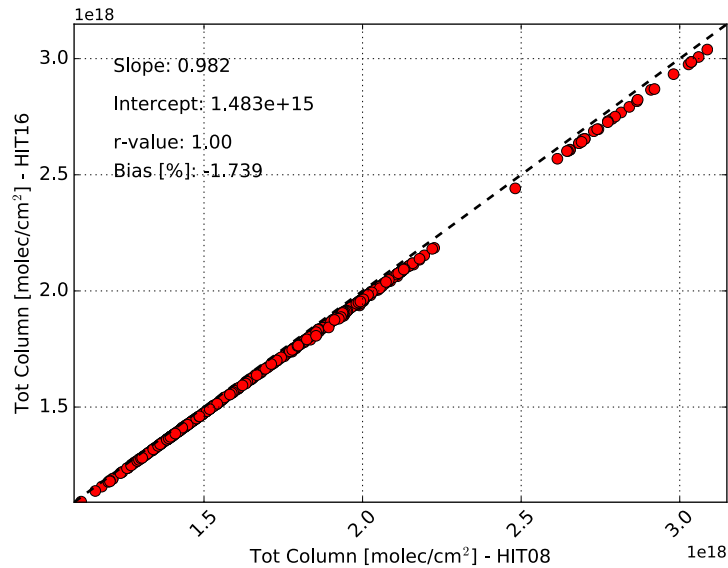
Difference of co_ATM18-Ret-2017 - co_HIT16-Ret-2017

Difference [molec/cm2] = 3.64833281899e+16
 Difference [%] = 2.16983961997

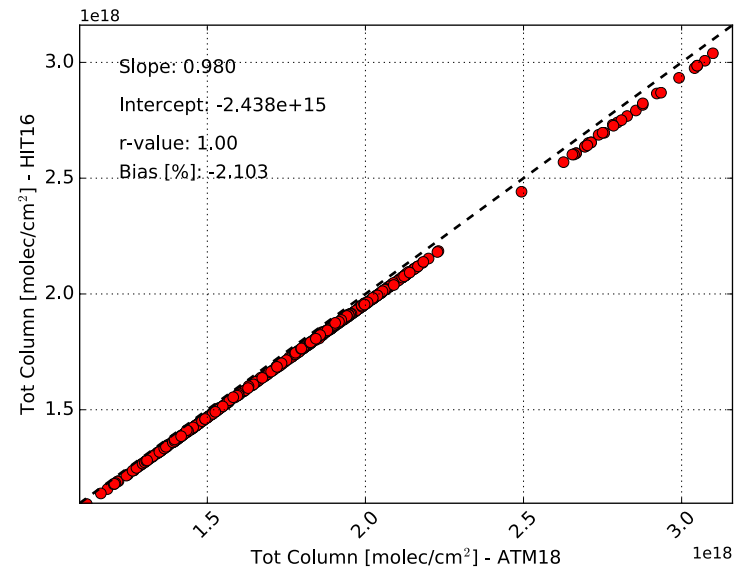
ATM 18 / 16 Retrieval Differences

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

Column
HIT08 / HIT16



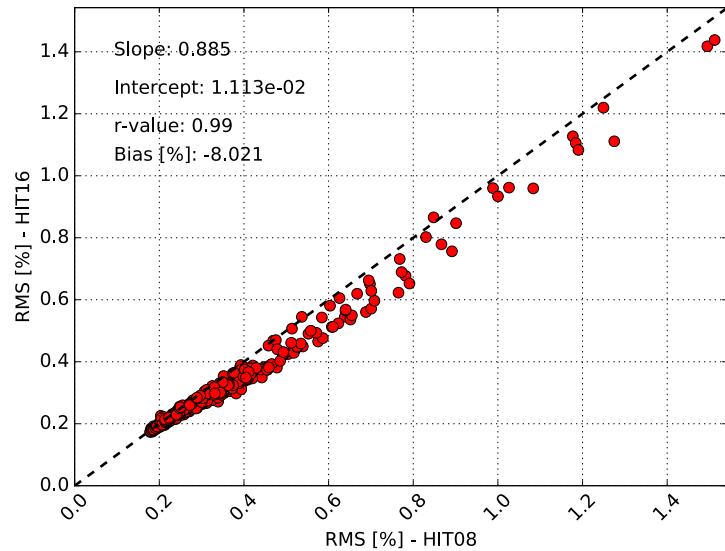
HIT16 / ATM18



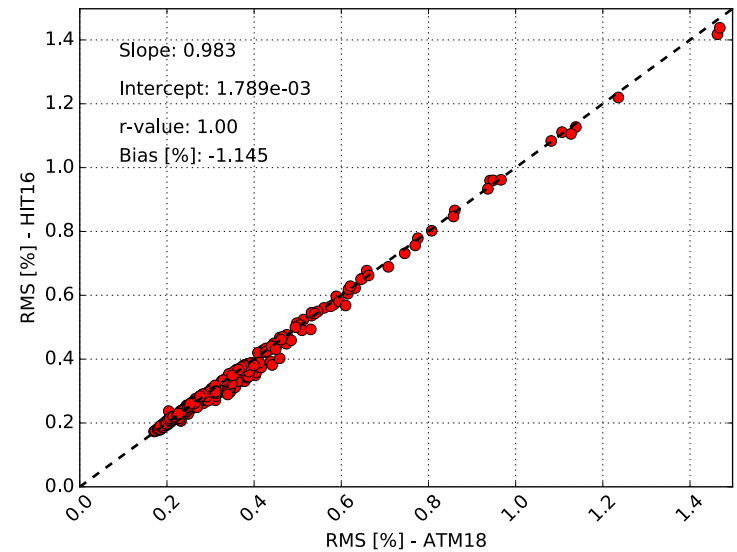
CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

Fit RMS

HIT08 / HIT16



HIT16 / ATM18



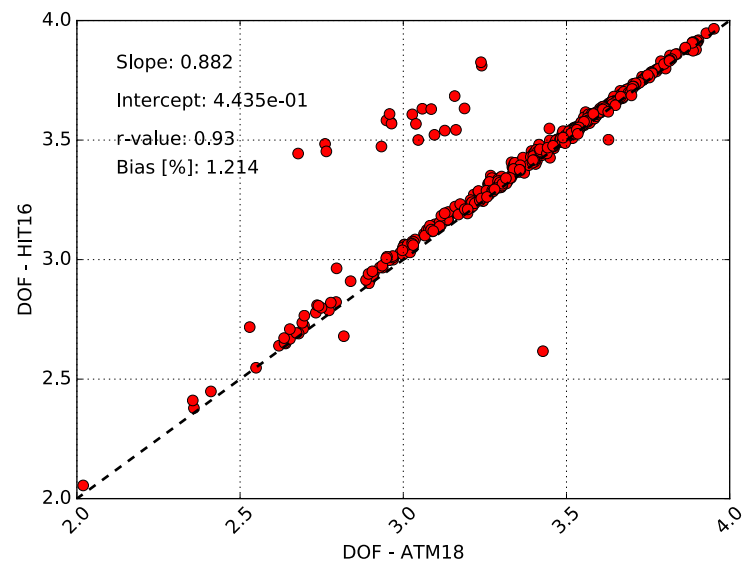
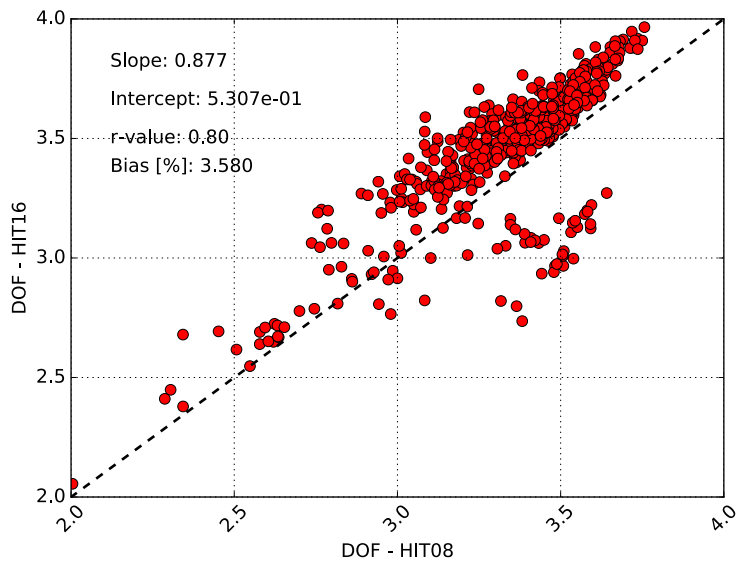
Fit improves from H08 and H16 A18 very similar.

CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

DOFs

HIT08 / HIT16

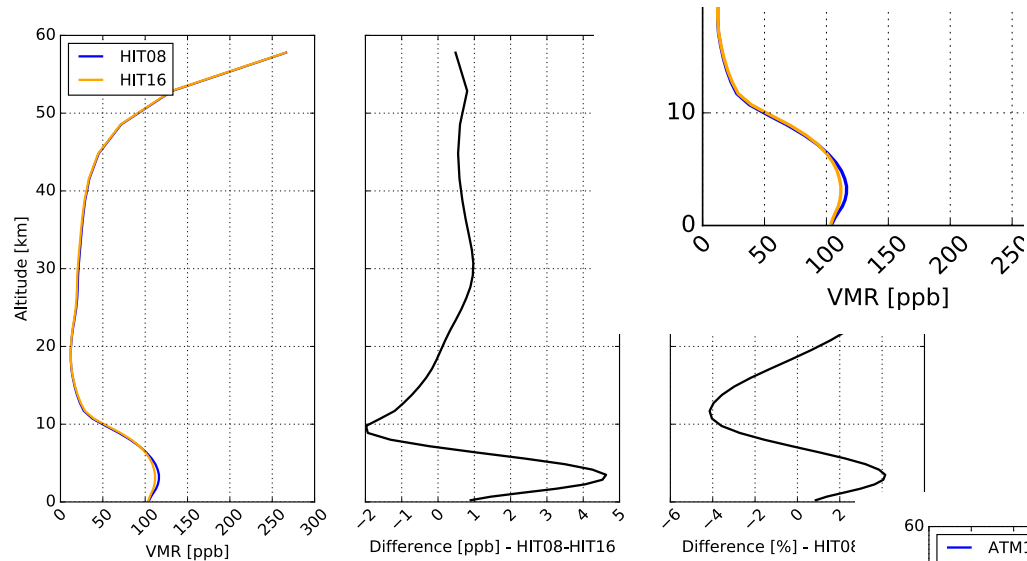
HIT16 / ATM18



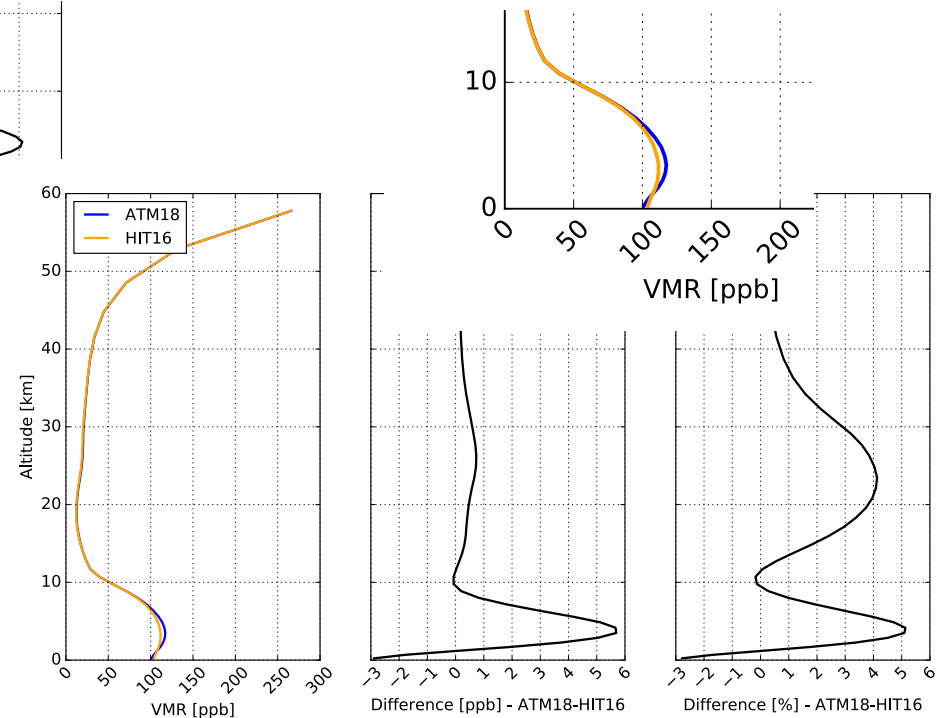
CO HITRAN 08 / HITRAN 2016 / Interim ATM18 Tests

Profile

HIT08 / HIT16



HIT16 / ATM18



- Tropospheric CO profile more well mixed for both H18 & A18.
- Decrease 4-5% in lower troposphere.