

For CO2

Download LM.zip from the HITRAN webpage (Supplemental) and unpack

in the code (version 2016) you have to save the quantum numbers and write them out as a linelist file.

The dependency of the Y Factor on temperature is not calculated. I assumed, most of the linemixing occurs near the ground, where the temperature of 296 is a good enough approximation.

```
in subroutine calcW
after line 1357
      if (isot(iBand).eq.10) then
        iso = 0
      else
        iso = isot(iBand)
      end if
      write(101,'(1X,I1,A1,A60,3(f9.3))') 2, Iso,
&      sig(iR,iBand), sum0, 0.0d0,0.0d0
```

```
comile
gfortran LM_calc_CO2_2017.for
and run
a.out
```

the LM linelist is in fort.101.

Next, match the linemixing parameters to the wavenumber in the HITRAN file, the matching to the quantum number does not work. The format of the linemixing file is

```
20      0 1 1 01      0 0 0 01      P 68e      -.111      0.00
0.00
```

The result copy in the linelist folder e.g.  
as 002\_CO2.hit16\_LM1ST.par