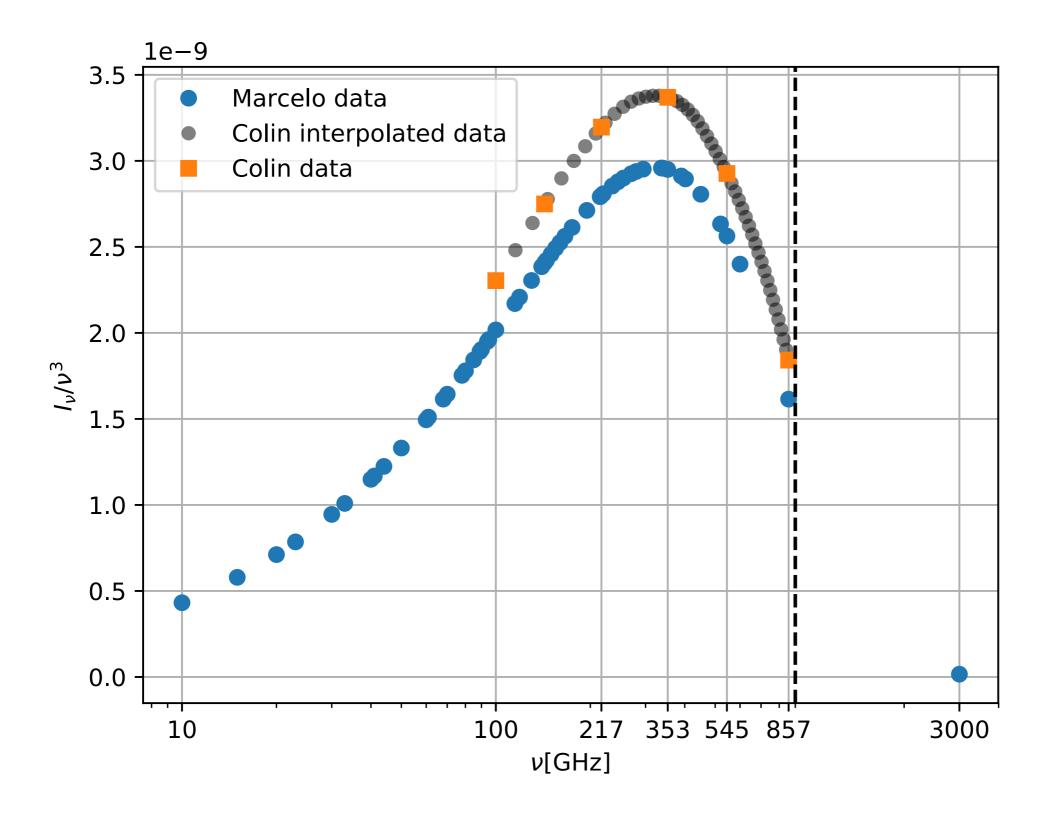
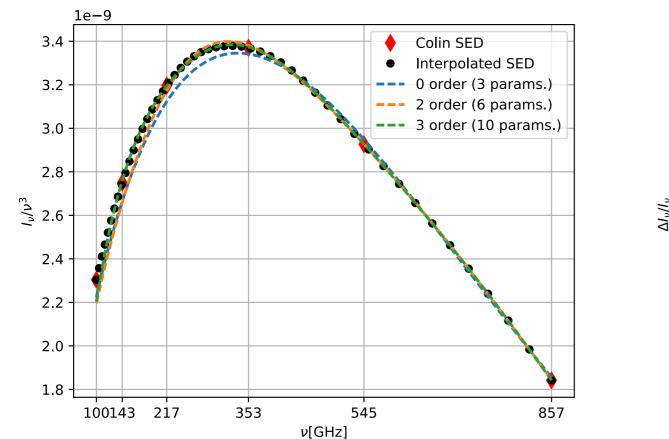
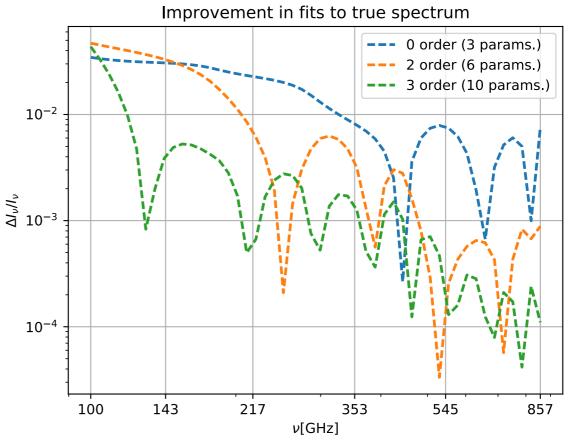
Intensity spectrum



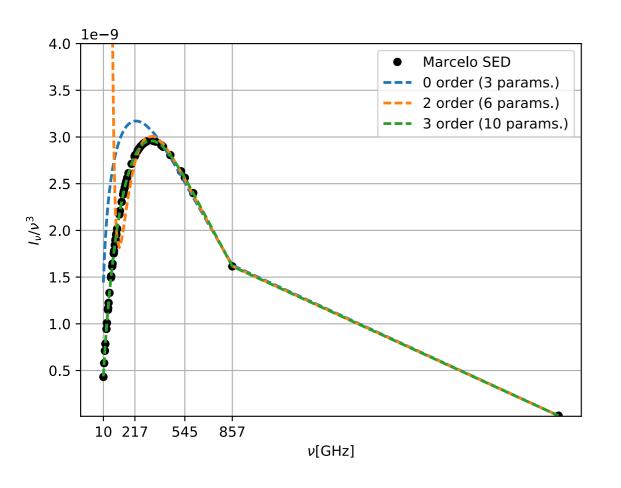
Fitting Intensity spectrum with Taylor moments Colin's CIB monopole SED

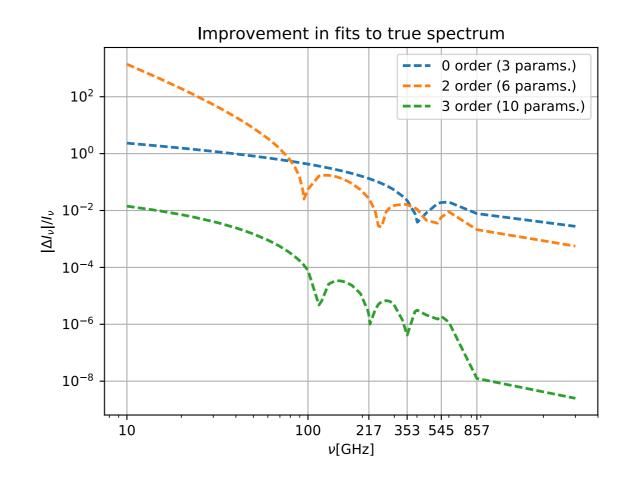




- We do a 10 parameter fit (3 base parameters and 7 Taylor moment parameters)
- Since we have to fit so many parameters, we Interpolate on the data to generate observations at 50 frequencies.
- We achieve about 4% accuracy at lower frequencies (100 GHz) and accuracy only becomes progressively better at higher frequencies.

Fitting Intensity spectrum with Taylor moments Marcelo's SED



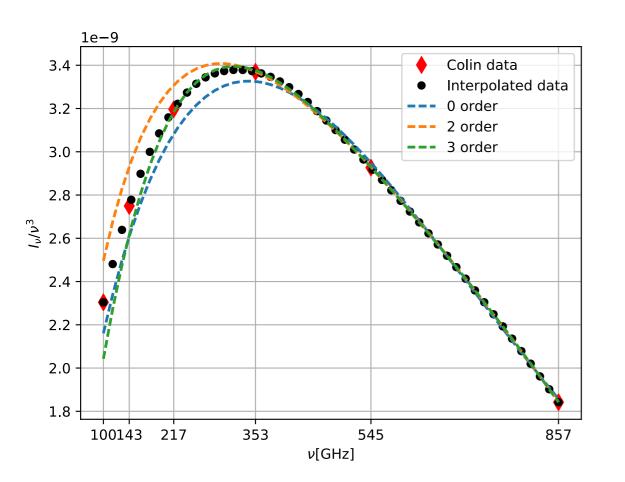


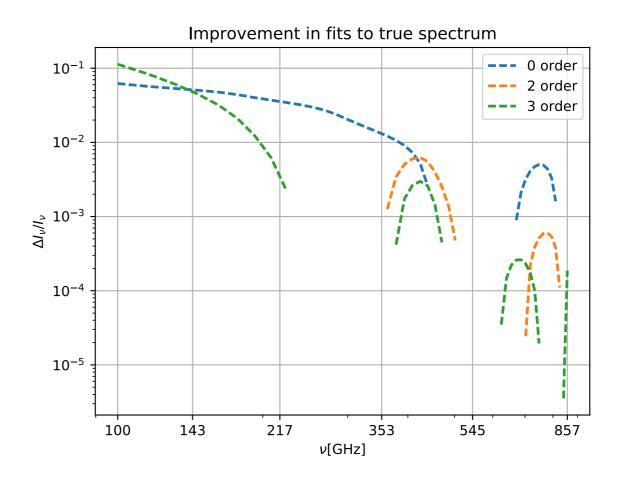
- We do a 10 parameter fit (3 base parameters and 7 Taylor moment parameters)
- Since the data provided has many frequency channels, we do not perform any interpolation and work with raw data.
- We don't ignore the data point at 3000 GHz.
- For the 3 order (10 parameter fit) we achieve ~1% accuracy at 10 GHz which only becomes progressively better for higher frequencies.

Toy model SED's ☐ Wide ☐ Wide 100 100 Wide ■ Narrow ■ Narrow Narrow Delta Narrow Delta -- Wide - Delta 80 80 --- Narrow - Delta 10^{5} 7 10^{4} 40 10^{3} 20 20 10^{2} 10^{1} 0.5 2.0 5.0 10.0 15.0 17.5 20.0 22.5 0.0 1.0 7.5 12.5 10² 10¹ 10³ Temperature T (K) ν[GHz] SED WIDE 10⁷ 10^{7} 10^{7} --- 0 order (3 params.) --- 2 order (6 params.) 10^{4} 3 order (10 params.) 10^{5} 10^{5} 10^{1} SED DELTA 3 10⁴ € 10^{-2} 0 order (3 params.) --- 2 order (6 params.) --- 3 order (10 params.) 10^{3} 10^{-5} 10^{2} 10-8 SED NARROW --- 0 order (3 params.) 10^{1} 10^{-11} --- 2 order (6 params.) --- 3 order (10 params.) 10^{0} 10³ 10³ 10^{1} 10^{2} 10² 10^{1} 10^{2} 10^{3} 10⁻³ 10⁰ 10^{-1} 10^{-5} 10^{-1} 10^{-2} 10^{-7} DELTA 10-3 10^{-9} --- 0 order (3 params.) --- 2 order (6 params.) 10^{-4} --- 3 order (10 params.) 10^{-4} 10-5 10^{-13} 10⁻⁵ WIDE NARROW --- 0 order (3 params.) --- 0 order (3 params.) 10-15 **---** 2 order (6 params.) --- 2 order (6 params.) --- 3 order (10 params.) --- 3 order (10 params.) 10 100143 217 353 545 857 3000 10^{2} 10^{3} 10^1 10 100143 217 353 545 857 3000 ν[GHz] ν[GHz] ν[GHz]

Old results

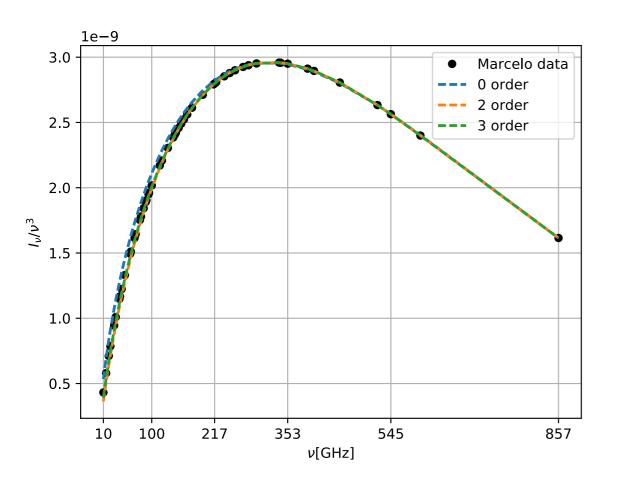
Fitting Intensity spectrum with Taylor moments Colin's CIB monopole data

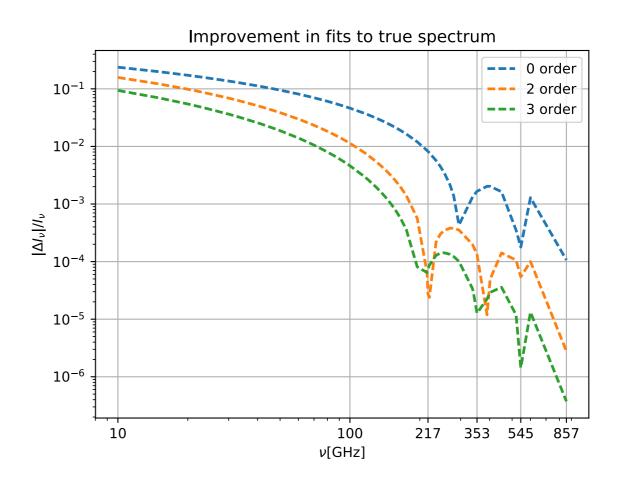




- We do a 10 parameter fit (3 base parameters and 7 Taylor moment parameters)
- Since we have to fit so many parameters, we Interpolate on the data to generate observations at 50 frequencies.
- 10% error on lower frequencies (100 GHz) but we are able to achieve sub-percent accuracy at frequencies above 217

Fitting Intensity spectrum with Taylor moments Marcelo's data





- We do a 10 parameter fit (3 base parameters and 7 Taylor moment parameters)
- Since the data provided has many frequency channels, we do not perform any interpolation and work with raw data.
- We ignore the data point at 3000 GHz.
- While we have higher error (10%) on lower frequencies, above 100 GHz we are able to achieve sub-percent accuracy.