

H. Matsuo* S. Matsushita
Nobeyama Radio Observatory
Minamimaki, Minamisaku, Nagano 384-1305
Japan

Fourier transform spectrometer (FTS) measurements of submillimeter-wave atmospheric opacity spectra have been performed in two winter seasons at the Pampa la Bola site (Northern Chile, Atacama 4800 m altitude). Atmospheric emission spectra, as a function of airmass, were measured under various weather conditions. In 1997 measurement, atmospheric opacity was rather high during all the observing period. In 1998 measurement, we could make opacity measurement under better weather condition during the observing period.

Atmospheric opacity was evaluated from sky temperature at the zenith as well as from tipping measurements, which are independent measures but give consistent results. The measurement also shows good match with radiometer measurements at 220 GHz, which is a good cross check between each method. Correlation diagrams between 220 GHz and 345 GHz, 410 GHz, 492 GHz, 675 GHz, 691 GHz, 809 GHz, 875 GHz are shown. In 1998 measurement we also measured correlation between 220 GHz opacity and opacities of three higher atmospheric windows at 1030 GHz, 1300 GHz and 1500 GHz. By comparing with the radiometer measurement at Chajnantor site (S. Radford and M. Holdaway, SPIE **3357**, 486-494, 1998), it is indicated that submillimeter-wave opacities are less than 1.0 about 40-60% of total period and the opacity is less than 0.5 about 10-20% of the period, when opacities at three higher atmospheric windows is less than 3.

Correlations between millimeter-wave and submillimeter-wave opacities get worse when 220 GHz opacity is larger than 0.1. Deviations from the opacity correlation at each frequency show good correlations themselves, but have different relative variations at each frequency. This indicates that atmospheric transparency cannot be characterized only by millimeter-wave opacity, but requires simultaneous opacity measurements at millimeter and submillimeter-wavelengths.

Reference # 0000

Session 0.00

1. (a) Hiroshi Matsuo
Nobeyama Radio Observatory
Minamisaku, Nagano 384-1305 J
matsuo@nro.nao.ac.jp
- (b) 81-267-98-4333
- (c) 81-267-98-4450
2. J
3. (a) Atmospheric transmission
at MM/submm
wavelengths
4. I, Program chair: S. Radford
5. No special instructions