Submillimeter calibration - experience from ground based observations

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Although the atmosphere allows observations from ground based telescopes in windows at 850, 750, 600, 450 and 350 μm, the sky is hardly ever photometric, and flux density calibration is therefore very difficult, especially since there are very few sources suitable for calibration. Furthermore, the large submillimeter telescopes (JCMT, CSO, SEST and IRAM) used for such observations are far from perfect, especially at the shorter wavelengths bands, resulting in large and often variable error beams, which makes calibration even more difficult.

Sandell (1994) made a first attempt to establish a set of secondary calibrators at sub-millimeter wavelengths. The emission from stellar photospheres is too faint in the sub-millimeter and therefore all calibrators were chosen from dust rich sources, i.e. Ultra-Compact HII (UCHII) regions, protostars, protoplanetary nebulae and AGB-stars surrounded by massive dust envelopes. New receivers, especially imaging bolometer arrays have shown that UCHII regions and protostellar sources are not suitable as calibrators, because they are embedded in massive dust clouds which provide a strong and variable background (Sandell, 1998). With more sensitive instruments one can, however, observe fainter sources, like isolated dust rich pre-main-sequence stars, asteroids, or even starburst galaxies like Arp 220. However, so far the most ideal calibrators in the sub-millimeter are protoplanetary nebulae like AFGRL 2688, which are strong and point-like in the sub-millimeter wavelength region (Sandell, 1998).

In this talk I will discuss in more details the problems in identifying and establishing a set of secondary calibrators at sub-millimeter wavelengths and whether such calibrators are likely to still be good at a 100 μm.

- Sandell, G., 1994, MNRAS, **271**, 75
- Sandell, G., 1998, http://jach.hawaii.edu/JACpublic/JCMT/Continuum_observing/SCUBA/astronomy /calibration/calibrators.html