

Solar Radiation Methodology

(Last rev. 18/05/2022)

Incoming solar radiation is measured electronically using LiCor Model Li200x Pyranometers (see figure 1).

When the meteorology station for the PNM crane was installed in 1996, the station was located mid-way up (~25m) the tower and to one side (see Fig. 1). The sensor is located at the end of a metal cross bar located below the tipping bucket. Pyranometers were first installed in Aug. 2007. The data from this sensor is kept in the files "PNM_crane25_sr". Due to their location, solar radiation was attenuated by the surrounding vegetation in the early morning and late afternoon. In addition, depending on the time of year, the crane itself blocked a small amount of SR around mid-day.

In March of 2008 two SR sensors were installed on the top of the tower (see Figure 2). The sensors at 25m were maintained for two years. The relationship between the solar radiation measured at the two locations is shown in Figure 3. The sensors are designated as Back (b) and Front (f). Solar radiation files have the format: "PNM_crane_sr[f/b]".

On June 14, 2016 the 'Front' sensor was replaced with a Kipp&Zonen SPLite2 pyranometer (see Figure 4).

Incoming solar radiation is sampled once every 10 seconds. The average, minimum and maximum values are recorded every 15 minutes. The reported value is the larger of both sensors for any given reporting interval.

Sensor elements are replaced with newly recalibrated sensors every year according to the manufacture's recommendations.

The original crane was dismantled in 2021 and a new crane, located approximately 10m away, was put into operation in January of 2022. The new crane is taller (~70m) compared to the original crane (~60m). There is a possibility that the additional height may result in additional solar radiation at sunrise and sunset. This will be investigated once enough data is available.

Figure 1



PNM tower showing met. station approximately at the middle of the tower



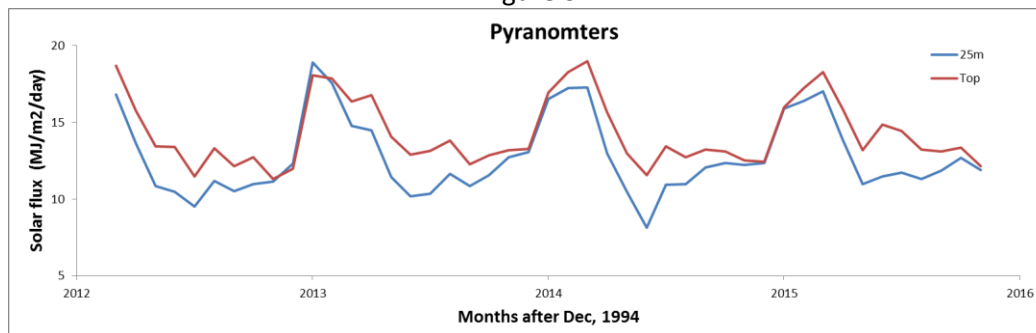
PNM Cranes (new crane left, old crane right)

Figure 2



Tipping bucket on top of the PNM crane.

Figure 3



Monthly total Solar flux as measured at the 25m and Crane Top locations

Figure 4



Kipp & Zonen SPLite2