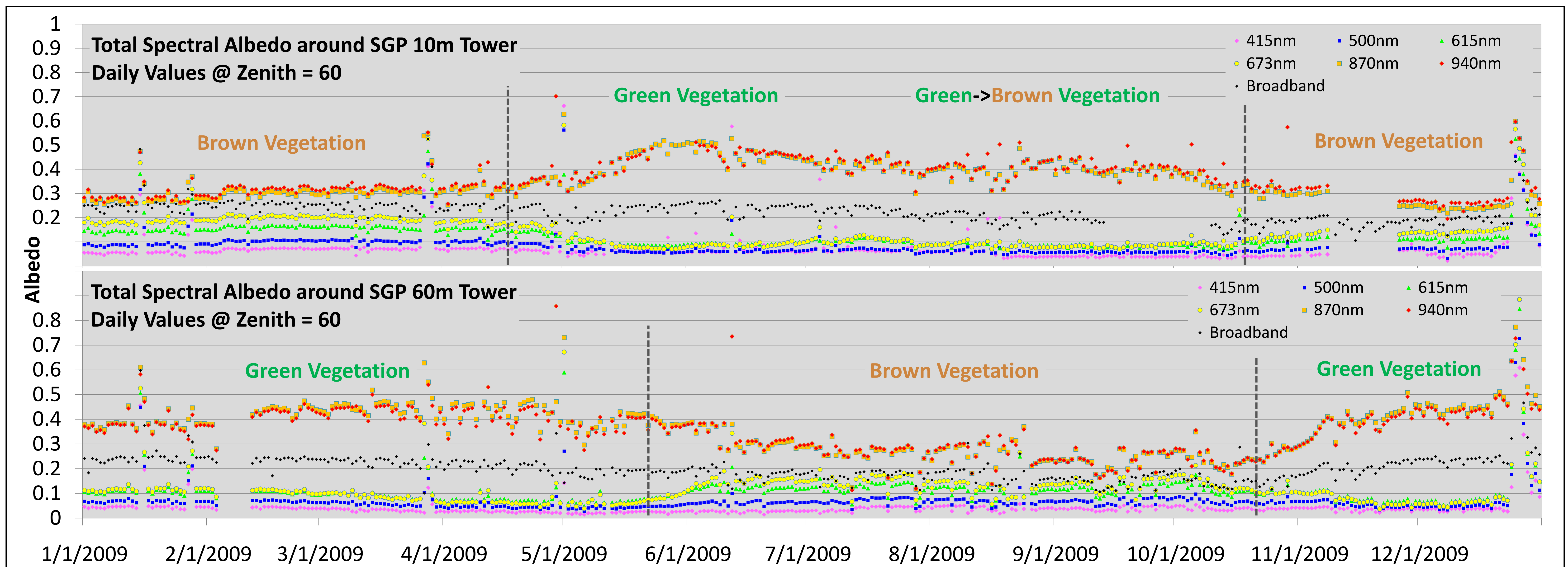


Variability of Total, Black and White Sky Spectral Albedo at the Central Facility

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The above two plots are time series of total spectral albedo as measured around the 10m tower (first plot) and the 60m tower (second plot). Note that on the 60m tower the instrument is mounted at 25m. Periods of generally green and brown vegetation are noted, with vertical dashed lines marking transition points. Broadband albedo is shown for reference.

We break the total spectral albedo into “black sky” and “white sky” components.

Black Sky Albedo: The absence of a diffuse component and a function of solar zenith angle.

White Sky Albedo: The absence of a direct component and independent of solar zenith angle.

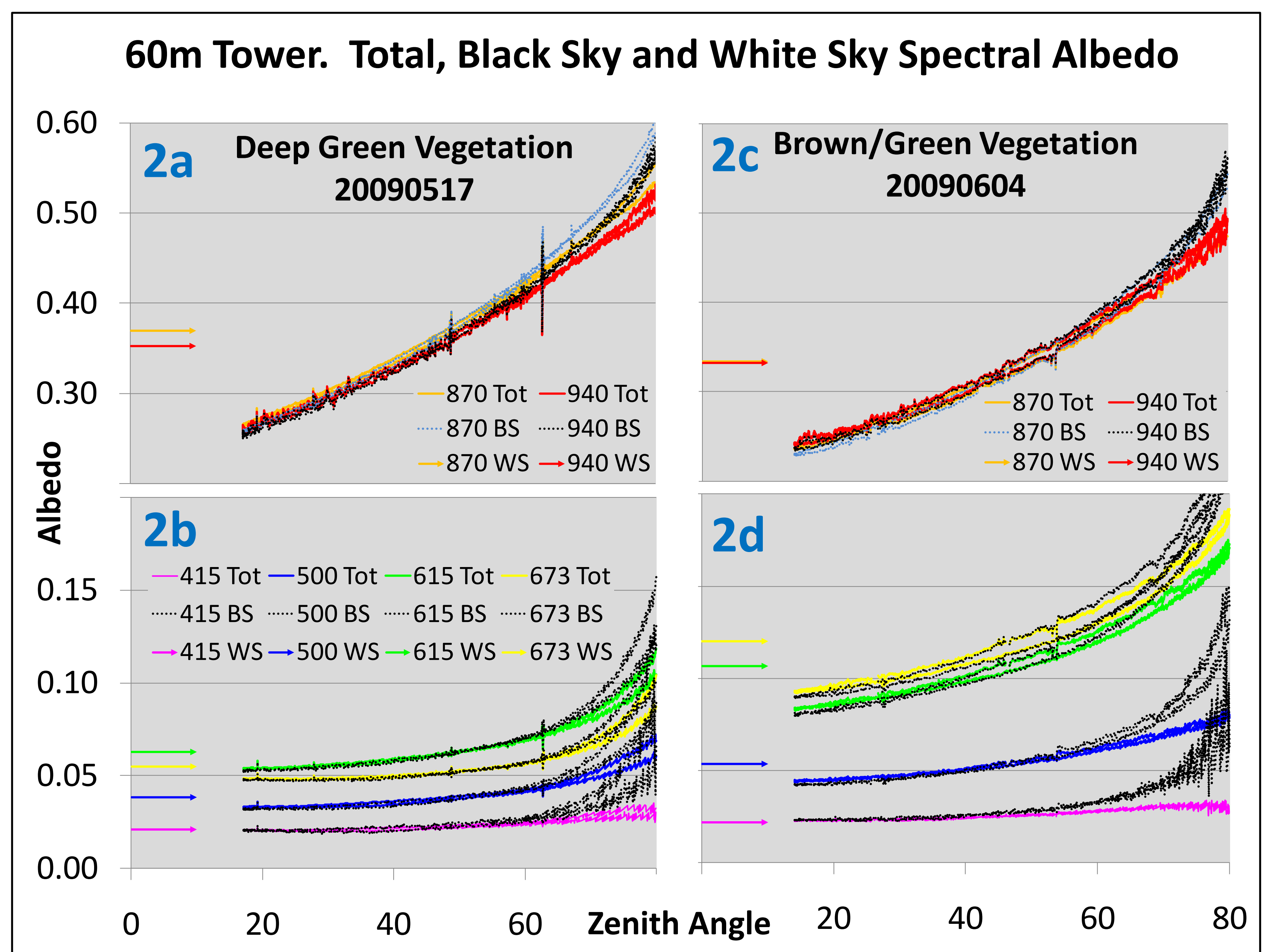
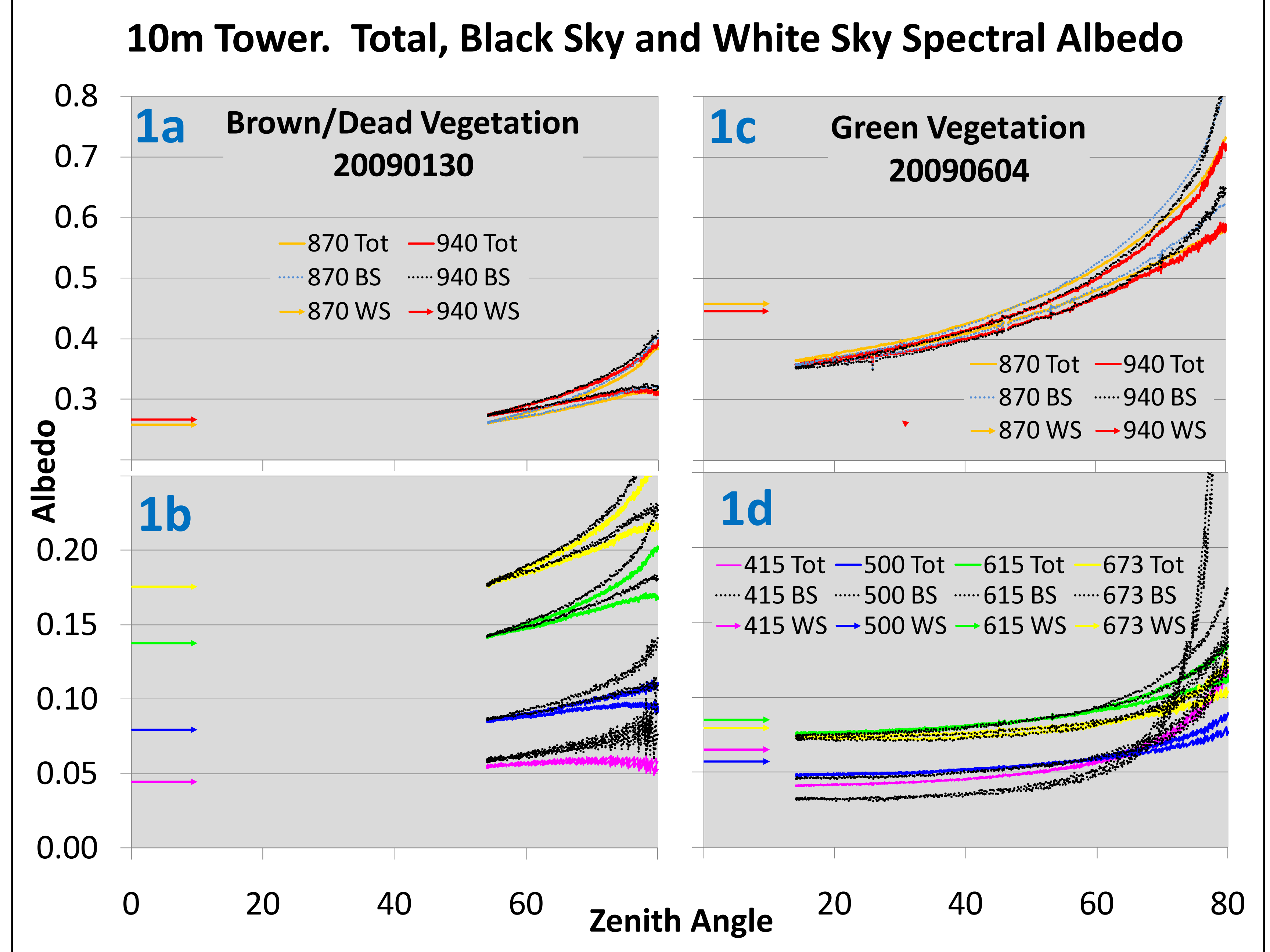
To calculate albedo_{BS} we assume albedo_{WS} is the same under clear and overcast conditions. An overcast day is coupled with a nearby day that is clear. Using the overcast albedo, or albedo_{WS}, albedo_{BS} is calculated with the equation below.

$$Albedo_{BS} = \frac{Total \uparrow - (Diffuse \downarrow \bullet Albedo_{WS})}{(Direct \downarrow \bullet Cos\theta)}$$

The panels at right show the total, black and white sky spectral albedo as a function of solar zenith angle.

Panels 1a – 1d: On 20090130 surface is dead vegetation, while on 20090604 it is generally green. Notice under green conditions we see higher values of 870 and 940, and lower values in the other channels.

Panels 2a – 2d: These show the characteristics of spectral albedo under deep green and then browning-up surface conditions. Around the 60m tower is an active agricultural field.



Images taken under 60m tower. Courtesy of LBNL/ESD.

