



**Figure 6.** Comparison of M<sup>3</sup> albedos (y axes) versus Clementine albedos (x axes) for the 11 Clementine band centers. Note that several of the plots do not share the same axes values. All plot axes do have a 1:1 relationship except 2780 nm, which is 1:3. M<sup>3</sup> was resampled to Clementine spectral resolution to create these plots. Since M<sup>3</sup>'s first spectral channel is 461 nm and Clementine's is 415 nm, we calculated Clementine's albedo at 461 assuming a straight-line fit between 415 and 750 nm.

subregolith lithology exposed in that location. In this way, the method reduces potential errors in interpretation of spectral features compared with using spectra derived from only a single pixel.

## 4. Discussion

### 4.1. Spatial Comparison

[18] Figure 2 shows M<sup>3</sup> and Clementine images of a small impact crater in the highland/light plains peninsula between Mare Tranquillitatis and Mare Fecunditatis. Figure 2 demonstrates the differences in spatial resolution between M<sup>3</sup> and Clementine's UV-VIS (Figures 2a and 2b) and NIR cameras (Figures 2c and 2d). The M<sup>3</sup> data used for this work are from OP1b, so the spatial resolution across its spectral range is ~140 m/pixel [Boardman et al., 2011]. Clementine's

spatial resolutions also varied by orbital altitude, but also by camera (see Table 1). Although Clementine UV-VIS DIMS are sampled at 100 m/pixel, and can be that good for the 750 nm channel, morphological features in Figure 2a are much clearer than in Figure 2b. Since the images from both instruments are taken at similar illumination conditions, the difference cannot be explained by shadows. The "blurry" appearance of Clementine images (compared with M<sup>3</sup> images) could be a consequence of the on-board compression algorithms, which were necessary for Clementine to map the entire Moon [McEwen and Robinson, 1997]. In the NIR, M<sup>3</sup> reflectance data (Figure 2c shows M<sup>3</sup> channel 2020 nm) at 140 m/pixel shows features remarkably clearer than the comparable channel for Clementine's NIR camera (2000 nm) at 500 m/pixel (Figure 2d).