MULTISPECTRAL MOSAICS OF THE GALILEAN SATELITES, T. V. Johnson,
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The Voyager 1 and 2 Galilean satellite images taken through color fil-
ters represent a potentially valuable multispectral data set. Preliminary
photometric calibration and analysis of a limited set of low to moderate res-
solution (~8-20 km/line pair) images is nearly complete. Initial calibration
removal of dark current, correction for shading across the vidicon target and
ground-based spectrophotometric data of the satellite's whole disk spectra. This comparison showed significant dif-
ferences between the spacecraft and telescopically derived data, particularly for the
ultraviolet (~0.35μm) and violet (~0.41μm) filters. Reduction of in-flight observations of the calibration plaque showed similar discrepancies between
pre-flight measurements of plaque spectral reflectance and the observations
reduced using pre-flight calibration sets. This suggests that the pre-flight calibration files are systematically in error by the amounts indicated by the
satellite and plaque data. This could in principle be due to either a change
in the cameras since the calibration files were taken or to inaccuracies in
the initial calibration. Since both Voyager 1 and 2 cameras show similar dif-
fences, we believe that calibration errors are the most likely source of
these differences, but in any case in-flight data before and after Jupiter
encounter indicate little or no change in photometric characteristics during
this period.

Using an average correction derived from the comparison with ground-based
data and the in-flight calibration, we have derived disk-integrated values of
grouped albedo in four spectral bands (0.35, 0.41, 0.48 and 0.59μm) for the
four Galilean satellites. The data were reduced to zero phase using the telescopically derived linear phase coefficients (see Morrison and Morrison, in
values are compared with telescopically derived data for the similar longitudes from
Nelson and Hapke (Taurus, 36, 304-329, 1978). This agreement in albedo is
within 10 to 20% in most cases which is our estimate of errors in the absolute
photometry. Spectral reflectance values from one filter to the next should in
general be good to better than 5 to 10%.

Figure 1a  Figure 1b
MULTISPECTRAL MOSAICS...

T.V. King et al.

We have taken images of different longitudes for each satellite and begun preliminary studies of global spectral properties. Individual frames have been calibrated as described above and geometrically projected to a simple cylindrical map version for production of global mosaics. Intensity levels in each frame have been reduced to normal albedo using a simple Minnaert correction and using a global phase coefficient. Normal spectral albedo values for several different terrain types on Europa and Ganymede are shown in Figures 2 and 3.

**Figure 2**

These data and color ratio composite images derived from the mosaics indicate that: 1) Europa has at least three distinct spectral units which differ in ultraviolet reflectance. The difference between darker mottled regions in the leading and trailing hemispheres could result from implantation of sulfur ions preferentially on the trailing side. 2) Bright plains on Europa are close to the same albedo as bright craters on Ganymede. 3) Bright ray craters in general are darker on Callisto than Ganymede, probably due to intrinsically darker target material. 4) Grooved terrain on Ganymede has a similar albedo to the darker stripes on Europa.

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