GLOBAL VIEW OF THE BRIGHT MATERIAL ON VESTA. F. Zambon[a], M. C. De Sanctis[a], S. Schröder[b], F. Tosi[a], J.-Y. Li[c], A. Longobardo[a], E. Ammannito[a], D. T. Blewett[d], E. Palomba[a], F. Capaccioni[a], A. Frigeri[a], M. T. Capria[a], S. Fonte[a], D. W. Mittlefehldt[e], A. Nathues[f], C. Pieters[g], C. T. Russell[h] and C. A. Raymond[i].

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Introduction: At 525 km in mean diameter, Vesta is the second-most massive and one of the brightest asteroids of the main-belt [1, 2, 3]. Here we give a global view of the bright material (BM) units on Vesta. We classified the BMs according to the normal visual albedo [4]. The global albedo map of Vesta [4] allows to be divided the surface into three principal types of terrains: bright regions, dark regions and intermediate regions. The distribution of bright regions is not uniform. The mid-southern latitudes contain the most bright areas, while the northern hemisphere is poor in bright regions [5, 6]. The analysis of the spectral parameters and the normal visual albedo show a dependence between albedo and the strength (depth) of ferrous iron absorption bands (Fig. 1); strong bands correspond with high albedo units. Vesta's average albedo is 0.38, [4, 7] but there are bright material whose albedo can exceed 0.50. Only the E-Type asteroids have albedos comparable to those of the BMs on Vesta. The Dawn mission observed a large fraction of Vesta's surface at high spatial resolution, allowing a detailed study of the morphology and mineralogy of it. In particular, reflectance spectra provided by the Visible and InfraRed spectrometer (VIR) [8], confirmed that Vesta's mineralogy is dominated by pyroxenes. All Vesta spectra show two strong absorption bands at ~0.9 and 1.9 μm, typical of the pyroxenes and associated with the howardite, eucrite and diogenite (HED) meteorites [8-11].

Results: Global analysis of VIR data carried out for the BM units reveals that the mineralogy does not differ from those of other Vesta regions [12]. All these areas have the common characteristic of having deeper pyroxene bands, and has been interpreted as fresh, unweathered material coming from the layers below the surface with a higher concentration of pyroxenes, representative of younger Vesta surface [6] [12] [13].
Notable exceptions are the bright regions in the Northern craters Bellicia and Arruntia, and the bright streak located in the southern crater (lat -65, lon 357) [12]. Unexpectedly, the bright material in Bellicia and Arruntia has been recognized as olivine mixed with pyroxene [14].

The nature of the bright material (the brightest of all the surface) in the southern crater is still under debate, being, at the contrary of all the other BM, the band depth shallower respect with the surrounding.

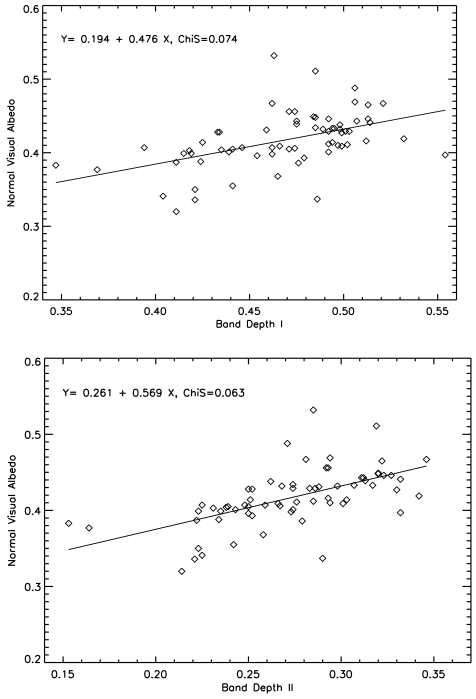

Figure 1: Correlation between band depth of the bright materials on Vesta and their albedo.

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