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GASPRA AND IDA IN FAMILIES

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The Galileo flyby candidates 951 Gaspra and 243 Ida are both in families. The former is in a complex of families associated with 8 Flora and the latter is in the Koronis family.

Fig. 1 shows a proper a-sin i projection of part of the Flora region near 8 Flora. The proper elements are from Williams and Hierath (1987) and Williams (1989). Only part of the Flora region is shown. The Flora region is a very complex region of the belt, consisting of adjacent and overlapping families (Williams 1991). 8 Flora is a 141 km diameter S (Tedesco et al. 1989) and the remaining asteroids in the figure are all small (<25 km). The cluster to the lower left of 8 Flora is family 189 which probably results from a cratering event. Cratering is suggested because 8 Flora is at the edge of the cluster (the material came off one side) and the small fragments are less than 25 km in diameter. The cluster to the upper right, actually two clumps, is family 183, probably another (or two) cratering event. The material to the lower right is thought to be overlapping families. Gaspra has been assigned to family 189 because it is close to the cluster, but as can be seen it is in a less dense zone between clusters and, due to the complexity of the region, cannot be guaranteed to have arisen from the same cratering event. Barucci et al. (1987) and Tholen (1989) classify Gaspra and Flora as Ss. Because the spectrum of Gaspra is similar to Flora (Zellner et al. 1985) and because Gaspra is near to Flora in a region dominated by small bodies which are thought to have come from Flora, Gaspra is almost certainly a piece of 8 Flora. The most likely alternative to

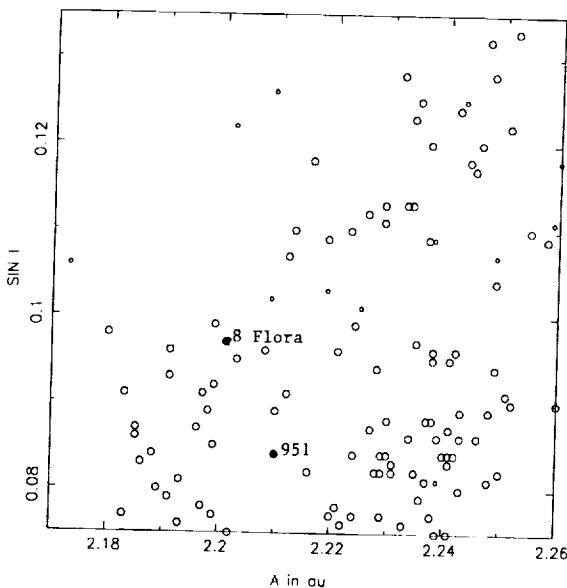


Fig. 1 Region near 8 Flora which contains 951 Gaspra.

cratering is the subsequent breakup of a larger fragment blasted off of 8 Flora. The event which created family 189 deposited part of the material in shallow Mars crossing orbits and there may be meteorite samples of Flora which are similar to Gaspra. Tedesco (1979) has done a study of asteroids in the Flora region. The Flora region and its proximity to Mars crossing are discussed further in Williams (1991).

243 Ida belongs to the Koronis family. The Koronis family (Fig. 2) consists of a dense core with surrounding material. 243 Ida is located in the dense core of the Koronis family as shown in the figure. The Koronis family results from the total breakup of its parent body. Ida is an S (Barucci 1987, Tholen 1989) like other Koronis family members (Gradie et al. 1979, Zellner et al. 1985, Bell 1989). Spectra are available (Chapman and Gaffey 1979, Zellner et al. 1985). The Koronis family is discussed further in Williams (1991).

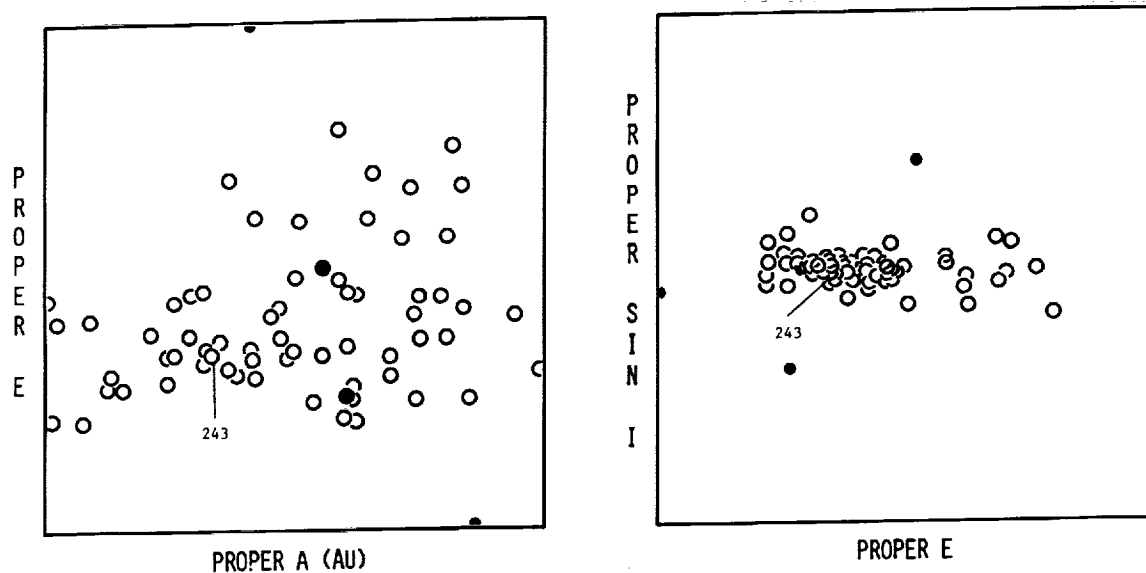


Fig. 2. The Koronis family with the location of 243 Ida indicated.

The Galileo spacecraft will have the opportunity to sample fragments from two types of impacts; one impact totally destroyed the parent body and the other left a large body behind. The types of Ss are also different, the colors of Gaspra and the other Ss in the complex of families near 8 Flora are much redder in U-V than Ida and the Ss of the Koronis family.

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