$TITLE$
Analysis of Magellan Gravity Data over Bell Regio, Venus, and Implications for Interior Structure.

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Bell Regio **has** been interpreted as a possible hot spot because of its broad# topographic rise, volcanic edifices, and large positive gravity anomaly. As# compared to other likely hotspots on Venus, it has more abundant volcanism,# less extensional fractures, and low relief. These characteristics suggest# that Bell Regio may be in a late stage of evolution. The Magellan# **line--of-sight gravity data have been inverted using** eigenvalue decompostion# to obtain **a vertical gravity field. This approach finds a** 'dynamic# solution', as the effects of the anomalous mass on the spacecraft are# included. 'l'he spacecraft altitude varies from 200 to 400 km in this region# (20-40 N, 40-60 E). The smallest wavelength that can be resolved is# approximately 270 km. Modeling of the spectral admittance shows that a # range of Te, effective elasitic thickness, fit the data. If only loading# from the top of the elastic plate is considered (such as by a volcanic # edifice), the best fit for Te is 10 km or less. If bottom loading (such as# by a thermal anomaly or viscous stresses due to a mantle upwelling) is also# allowed, then Te is 20-25 km, for **a** ratio of bottom to top loading of# 0.3-0.45. Modeling of the coherence favors a value of 20-25 km for Te.# A relatively small bottom/top loading ratio, which implies a modest # thermal or dynamic: anomaly, is consistent with the idea that Bell Regio may# be in **a late stage** of evolution. Preliminary results from linear filtering# methods suggest that the compensation depth of the swell is '200 km. The# geoid-to-topography ratio is 12.3+/-.4 m/km, which is *much lower* than the# value (-21 m/km) found using Pioneer Venus gravity data. This decrease may# be due, in part, to the higher resolution of both the gravity and# topography data. In the Pioneer Venus topography data, the height of a# prominent volcanic edifice, Tepev Mons, was underestimated by several# kilometers. These results demonstrate that analysis of Magellan gravity # data provide far more information about the interior structure of Venus # than has been available in the past. The determination of Te and swell# compensation depths at other probable hot spots *on* Venus should increase# our understanding of the evolution of these highlands and their # contribution to the present day heat budget of Venus.

$INFO$

1. 1993 Fall Meeting

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4. P

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9. C

10. **No special requests**

11. No