

# GEO369 – Introduction to Geophysics

29 September, 2004

Bevill 266

## Class 12: Magnetic Modeling with GM-SYS

Today you will be modeling a series of parallel dykes of alternating magnetic polarity. Such a configuration is similar to the alternating polarity magnetic stripes observed parallel to a seafloor spreading center.

Please follow these steps:

1. Start GM-SYS (Start – All Programs – GM-SYS – GM-SYS). Click on OK in the box that pops up.
2. From the main menu select “File – Open Model”.
3. Select imiloa1 – amg – GEO369 – Class12 – seafloor\_model.sur
4. Re-save the model to one of your own directories (File – Save As).
5. You will see a 2 km layer of water overlaying a block model. This represents a seafloor spreading model assuming a opening rate of 60 km/Myr.
6. The “spreading center” is at  $x=75$  km on the profile.
  - a. Examine the block using the eye icon. Note that the block in the center has an inclination of -32.4 degrees and a declination of 8.1 degrees. This block of crust has been formed during the Jaramillo chron, 0-0.78 Ma. The adjacent block was formed between 0.99 and 1.07 Ma, but with opposite polarity, and so on.
7. Currently the profile is oriented north-south. Try changing the orientation of the profile. What is the effect
  - a. To do this, select Profile – Set Azi/Strike angle. If the profile azimuth is 90, that means it is E-W, if it is 0 it is N-S.
  - b. You may have to re-calculate the anomaly (Compute – Calculate).
8. The location of the profile on the earth is set by the magnetic parameters inclination and declination (given above for the actual location of the profile). Try changing the inclination. This effectively changes the location of the profile.
  - a. To do this, select Profile – Set Magnetic Field.
  - b. Some examples of magnetic anomalies at different latitudes and with different orientations were given in the lecture. Try to reproduce some of these.
  - c. You may want to also change the properties of some of the bodies.