

# MESSENGER and Mariner 10 Magnetic Field Data Shows No Secular Variation Over 40 years

- Magnetic field data from MESSENGER and Mariner 10 were compared to constrain the secular variation in Mercury's internal field over the past 40 years.
- The orbital (MESSENGER) and flyby (Mariner 10) measurements of the magnetic field were used to produce a time-averaged dipole model with  $Z(d)$  offset.
- The root mean square (RMS) misfit between the model and Mariner 10 flyby (M10-III) data are shown by parameter pairs of the best-fit offset of  $Z(d)$  at 882 km (filled square) and 475 km (filled circle) respectively. The diagonal dashed line shows a trade-off between best fit dipole and dipole moment. A horizontal dashed line shows the best-fit dipole. Blue triangles correspond to parameter pairs.
- Magnetic field observations are shown (right) for M10-III for inside the magnetopause (solid), best fit model for dipole offset of 475 km (dash) and 882 km (dot).
- The results are consistent with no secular variation in Mercury's magnetic field in the last 50 years.

