

Even Weak Shocks Are Not Smooth...

What is the science question?

What is the structure of weak shock waves? Scientists believed that weak magnetic shocks were smooth, laminar.

What were your findings?

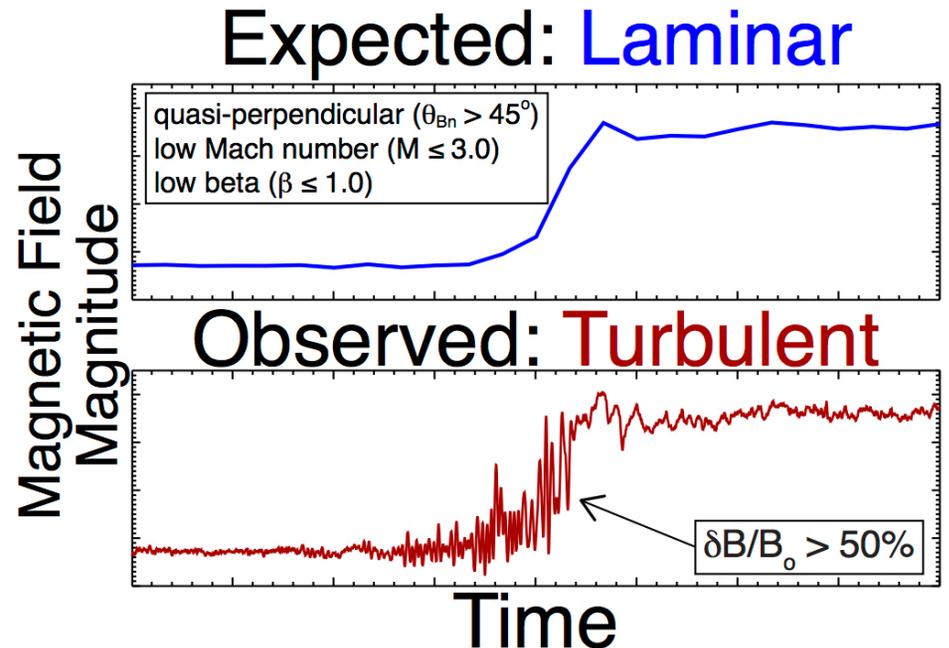
- We find that weak shocks are not laminar, but are in fact turbulent.
- We also find that waves often have larger amplitudes than the shock and background fields, e.g. imagine seeing a 2 ft wave in water only 1 ft deep.

What was the impact?

- We have a new and better understanding of the evolution and propagation of shocks through the solar system.
- We also find that shocks are intrinsically 3D.

Why does it matter to non-scientists?

- Space weather: This changes coronal mass ejection arrival time estimates.
- Understanding radiation storms: We find that waves can accelerate particles to relativistic energies.



The top figure shows a relatively smooth or laminar shock that scientists expected. The bottom figure shows what is observed in space, a complex, turbulent shock.