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Twisted Tubes -- Chapter 6: Instabilities -- 6.1: Introduction -- 6.2: Rayleigh-Taylor (RT) Instability -- 6.3: Kelvin-Helmholtz (KH) Instability -- 6.4: Parametric Instability -- 6.5: Parker Instability -- Chapter 7: Waves in the Sun -- 7.1: Five minute oscillations -- 7.2: Oscillations in Sunspots -- 7.3: Chromospheric Oscillations -- 7.4: CoronalWaves -- 7.5: Coronal Seismology -- 7.6: Coronal Heating due to Waves -- 7.7: EIT and MoretonWaves -- Chapter 8: Heliosesimology -- 8.1: Equations of Motion -- 8.2: Equilibrium Structure -- 8.3: Perturbation Analysis -- 8.4: Acoustic Waves -- 8.5: Internal Gravity Waves -- 8.6: Equations of Linear Stellar Oscillations -- 8.7: Properties of Solar Oscillations (Internal) -- 8.8: p and g modes -- References -- Index.

Sommario/riassunto

Astrophysicists and others studying the Sun will find this expansive coverage of what we know about waves and oscillations in our nearest star an informative introduction to a hot contemporary topic. After a section summarizing the Sun's physical characteristics, the volume moves on to explore the basics of electrodynamics, which in turn facilitate a discussion of magnetohydrodynamics (MHD). The material also details the often complex nature of waves and oscillations in uniform and non-uniform media, before categorizing the observational signatures of oscillations and exploring the instabilities in fluid, dealing with a range of known forms. Lastly, a section on helioseismology explores our growing familiarity with the internal structure of the Sun. This book is a unified portal to a thorough grounding in solar waves that includes a wealth of explanatory vignettes demystifying concepts such as flux tubes, current-free and force-free magnetic fields, the prominences, and the relationship between the vorticity and the induction equation. It also sets out the elegant Parker solution describing the phenomenon of solar wind. The volume will inspire readers with the unbridled enthusiasm of astrophysicists who view the Sun as a giant natural plasma laboratory, in interstellar terms located right on our doorstep, in which they can apply and then verify experimental and theoretical studies on plasma through their own observation.