An Introduction To Alfven Waves

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Alfvén Waves in the Solar Atmosphere
From Theory to Observations

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Abstract Alfvén waves are considered to be viable transporters of the non-thermal energy required to heat the Sun's quiescent atmosphere. An abundance of recent observations, from state-of-the-art facilities, have reported the existence of Alfvén waves in a range of chromospheric and coronal structures. Here, we review the progress made in disentangling the characteristics of transverse kink and torsional linear magnetohydrodynamic (MHD) waves. We outline the simple, yet powerful theory describing their basic properties in (non-)uniform magnetic structures, which closely resemble the building blocks of the real solar atmosphere.

Keywords Sun: Alfvén waves · Sun: chromosphere · Sun: corona · Sun: spicules · Plasma wave heating

1 Introduction

The solar coronal plasma is an ionised gas which is mainly confined by the ubiquitous presence of magnetic flux tubes and open magnetic field lines. These structures demonstrate sizes over very large scales, right down to the current observational limit, and are maintained at temperatures of several million Kelvin. The heating processes that generate, and sustain the hot corona have so far defied quantitative understanding, despite efforts spanning more than half a century (Kuperus et al. 1981; Gomez 1990; Zirker 1993; Ofman 2005; Klimchuk 2006; Taroyan and Erdélyi 2009). Efforts to establish the causes of

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Alfven Wave by Hasegawa & Uberoi (), and An Introduction to Alfven features of the physics of Alfven waves across the various plasma environments.The principal ingredient in parallel dynamics is the kinetic Alfven wave. Perpendicular to the field, it is ExB motion in the presence of the background thermal.INTRODUCTION. Background: Alfven waves are well known low frequency oscillations of a uniform magnetised plasma and were first treated in a classic.An Introduction to Alfven Waves, (Plasma Physics). Book Binding:Hardback. Author:Cross, R.C. Book Condition:VERYGOOD. World of Books USA was founded.Basic Introduction - What is an Alfven wave? An Alfven wave is like a wave travelling along a stretched string. The magnetic field line tension is analogous to .Introduction. The kinetic Alfven wave is the Alfven wave for which wave-particle interactions are important [Mikhailovskii and. Rudakov, ; Stefant, ;.Chapter 2 - Alfven Wave Experiments. Introduction. 2,2. Theory. Experimental Apparatus. Diagnostic Equipment. INTRODUCTION Large amplitude Alfven waves propagating parallel to the magnetic field are observed in the solar wind, upstream of Jupiter's bow shock and in.Introduction. Alfven waves have been subject of interest to fusion community since 70's. At the time, the main topic of interest was plasma heating scheme via .