Pereira & Opher 1989b), atmospheres of late-type stars (Hartmann & MacGregor 1980; Jatenco-Pereira & Opher 1989a), Wolf-Rayet stars (dos Santos et al. 1993), extragalactic jets (Gonçalves et al. 1993), and others.

Alfvén waves are generated easily in many cosmic plasmas. As they are not compressive, the nonlinear decay occurs due to second order effects in the wave amplitude. Interacting Alfvén waves are compressive, and thus generate a new compressive wave (Chin & Wentzel 1972). The dissipation of these waves may contribute to heating the solar corona, interpreting the interplanetary wave spectrum, and determining the wave spectrum available to scatter the cosmic rays. In many other ambients, this dissipation, with the consequent deposition of momentum and energy, can be, at least, an important physical process competing with others.

Then, we show here, the application of dissipation of Alfvén waves, as a source of heating, on the broad line regions of quasars (Gonçalves et al. 1996a), and on the corona of hot stars (Gonçalves et al. 1996b).

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ASTROPHYSICAL CHARACTERISTICS OF CONTACT BINARIES REVISITED

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Fundamental parameters, particularly masses, of a sample of well studied contact binaries are uniformly computed. First we prove that pure photometric data can provide results in relatively good agreement with those obtained from both spectroscopic and photometric observations. Then we analyse the errors introduced in the computations by uncertainties concerning the systems age, chemical composition, temperatures and other elements. A similar process is applied to main sequence detached binaries in order to compare the dispersion of results. Finally, we discuss the confiability of the proposed method in order to infer reliable parameters for contact binaries.

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A 3-DIMENSIONAL PHOTOIONIZATION MODEL FOR THE BIPOLAR PLANETARY NEBULA IC 4406

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We developed three-dimensional self-consistent photoionization models in order to make more realistic studies of asymmetrical and inhomogeneous photoionized nebulae. The gaseous region is divided in a great number of cells, and the physical conditions in each cell, as well as the effect of each cell on the others, are treated in detail. These models allow any possible geometry for the gas distribution. A model for the planetary nebula IC 4406 is built. This nebula is a typical example of bipolar planetary nebulae, often associated with Type I planetary nebulae. The model is obtained assuming a torus of dense material around the central star, as suggested by Sahai et al. (1991). Chemical abundances required to explain the observed line intensities are compared with typical abundances of Type I planetary nebulae. A theoretical map of the line Hα+[N II] is compared with the observed one, confirming the existence of the torus.

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