## THE JACOBI DYNAMICS APPLIED TO PULSATING STARS

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In this work, we apply the principles of Jacobi Dynamics to short period pulsating stars. This theory was developed by Ferronsky et al. (1978, Celes. Mech., 18, 113) in which an analytical solution of the Jacobi's equation was found. The applications of the Jacobi Dynamics to the stellar evolution are suggested in many recent works (Quiroga & Claret 1992a, Ap&SS, 193, 185; Quiroga & Claret 1992b, Ap&SS, 193, 235). Here, we calculate the periods associated with a purely radial fundamental mode for $\beta$ Cephei and $\delta$ Scuti stars, employing a time-scale associated with a quantity, namely, the amount of action $A_c$, analogous to the angular momentum, but related to all non-rotational motions inside the star (thermal and convective motions). The ranges of periods so obtained are in very good agreement with the observed ones.

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## THE THREE SOURCES OF GAS IN THE COMAE OF COMETS

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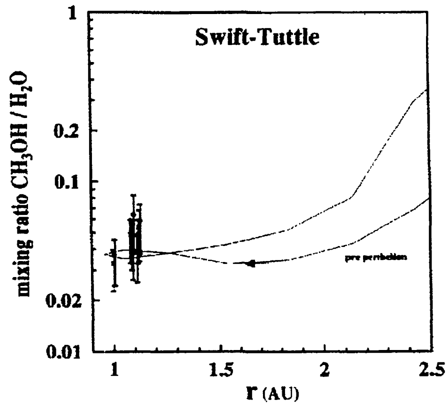
Water ice on the surface of a comet nucleus usually is the major source of coma gas. Dust, entrained by coma gas, fragments and vaporizes, forming a second, distributed source of coma gas. Other ice species, more volatile than water ice below the surface of the nucleus, are a third source of coma gas. Vapors from these ices, produced by heat penetrating into the nucleus, diffuse through pores outward into the coma. Source types two and three provide some easily detectable coma species. Among them is methanol ($CH_3OH$) which is more volatile than $H_2O$. We present mixing ratios of $CH_3OH/H_2O$, obtained by DiSanti et al. (1995) from observations of Comet Swift-Tuttle, as a function of heliocentric distance, $r$, and compare the ratios with model predictions. The increase in the mixing ratio with increasing $r$ is caused by the rapidly decreasing release rate of




water vapor relative to a much smaller decrease in the release rate of $CH_3OH$ from the interior of the nucleus. Observed mixing ratios from larger values of $r$ are needed to verify the model.

DiSanti, M.A. et al. 1995, Icarus 116, 1

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## PROJECTIVE GEOMETRY IN DYNAMICS AND CELESTIAL MECHANICS

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A geometrical interpretation of some aspects of the dynamics of the Solar System is given in this paper. The model is investigated by applying Projective Geometry to the instantaneous motion of the two-body problem. Given the following vectors: f (laplacian), P (directional), A (directional), M (triangular momentum), it is shown, by means of the harmonic construction, that:

1. Several projective invariants represented by variable surfaces are obtained.
2. The existence of fields of rationality must be taken into account in order to assure continuity. This is necessary for subsequent topological considerations.
3. The application of the theory of Reciprocal Polars allows to understand the interchange roles of point and line perturbations.

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