

CONCERNING THE EXISTENCE OF THE SATURN FAMILY: RADZIEVSKIJ-TISSERAND CONSTANTS FOR COMETS 6P/D'ARREST AND 8P/TUTTLE

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Earlier, the division of comets into the families of Jupiter, Saturn, Uranus and Neptune was regarded as undoubted. The modern classification retains only the Jupiter family, and comets with larger aphelion distances belong to the Halley type. The transition from the old classification to the new one still raises criticism. The Radzievskij-Tisserand criterion was proposed as a measure of the dynamical relation of comets to planets. This quantity, which is constant within the framework of the restricted three-body problem, fits the orbital semimajor axis of the second body, that is, the perturbing planet. Although this criterion was already applied practically, the exact technique of its use for comets observed in multiple apparitions was not still elaborated, which made obtained results doubted. The present work starts with the application of the Radzievskij-Tisserand criterion to 6P/d'Arrest as an example of an undoubted Jupiter-family comet. The most robust and the most sensitive to the Jupiter's presence parameters of the distribution of apparition pairs in Radzievskij-Tisserand constant are revealed. Next, the same technique is applied to 8P/Tuttle which is the most studied of the presumed Saturn family comets. It is shown that, in the aspect of the Radzievskij-Tisserand criterion, Jupiter is the main perturbing body for 8P/Tuttle. Any feature of the distribution in the Saturn's semimajor axis vicinity is not present. So, the new classification is confirmed.