

On Central Configurations of Twisted Rings

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We look for central configurations of the $(\kappa n + 1)$ -body problem where κn masses are at the vertices of κ regular n -gons and a body of mass m_0 is located at the common center of mass. All the masses in each regular gon are equal, m_i , $i = 1, \dots, \kappa$. We consider the case of *twisted rings*, that is, when at least one of the rings is rotated an angle of π/n with respect another ring. When $m_0 = 0$ we present the results obtained in the case of $\kappa = 2$. Unlike the case of nested rings, studied by several authors, given a value of the mass ratio m_2/m_1 , the number of central configurations depends on n : for $n = 2$ there exists only one, for $n = 3$ it can be 1, 2 or 3, and for $n \geq 4$ there exists at least 3 different central configurations. Finally, we study how the number and location of central configurations vary when the central mass $m_0 > 0$ is added.

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