

# H.E.S.S. Observations of the TeV $\gamma$ -Ray Binary PSR B1259–63/SS 2883 in 2005, 2006 and around the 2007 Periastron

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**Abstract.** PSR B1259-63 represents a system where a radio pulsar is orbiting a massive Be star in a highly eccentric orbit ( $e=0.87$ ). Interactions between the pulsar wind and stellar outflows can provide shock mechanisms that accelerate particles to very high energies (VHE). These interactions are thought to become most efficient around periastron passage where the two objects are separated by the minimal distance of 0.7 AU. The system is known as a VHE emitter since its discovery in the TeV regime around the 2004 periastron (March 7, 2004) by H.E.S.S. A light curve for the system covering mainly the post periastron part could be deduced, clearly showing a variable flux in VHE photons making PSR B1259-63 the first variable Galactic VHE source ever detected. In 2005 as well as 2006 the system was monitored by H.E.S.S. at large orbital separations. More data were taken in 2007 from April to August with the system approaching its next periastron (July 27, 2007). An analysis of these data will be presented including the deduced light curve at orbital phases not covered by earlier observations. The results favour models not being based solely on the interaction between the pulsar wind and the companion's disk such as Inverse Compton scenarios occurring in the stellar photon field.

**Keywords:** TeV  $\gamma$ -ray binary, pulsars, VHE observations