Geophysical Research Abstracts, Vol. 8, 00547, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00547

Were Freak Waves involved in the sinking of the Tanker “PRESTIGE” ?

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This paper deals with the possible involvement of freak, rogue or giant waves in the damage suffered by the Prestige, which eventually led to its sinking. By reason of their very characteristics, giant waves are hard to record. Their more or less sudden appearance make them fairly elusive objects, except for the consequences they produce. However, some indications can be considered with regard to the greater or lesser probability of their occurring, according to what extent the maritime weather conditions of the area come close to the optimum conditions for generating them.

According to the CEDEX report on maritime weather conditions , and taking data from the Silleiro buoy for November 2002, on the 13th significant wave height was 9m and maximum wave height 14m, these values being high, but not exceptional. The relation between the two heights is the normal one corresponding to a Rayleigh distribution. The significant wave steepness on the same day is 0:062, which if presented in ‘ak’ form would be 0.1948, which is quite high.

The well known modulational instability mechanism leads to the decomposition of an initially homogeneous train of Stokes waves, firstly into a series of groups of waves, whose envelope then produces the so-called “solitons”, which then collapse in the form of a giant wave. This mechanism mainly occurs in deep waters. Zakharov studied this mechanism in 1968 and ,independently, Benjamin and Feir.

Taking into the account that climatic wave in the area was conspicuously two dimensional, one way to answer the question of the titre of the paper is to check how near or far the wave field was to be within the limits of the instability domain in the different approximations. That is the main aim of the paper