



## Gibraltar Straits crossing: a new design proposal

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Marco Peroni, born in 1965, received his civil engineering degree from the University of Bologna, Italy. In 1992 he related a thesis about the design of Messina Straits bridge with Prof. Massimo Majowiecki.

### Summary

At the start of a new millennium, the plan to permanently bridge the historic gap of the Gibraltar Strait has begun research design to create the most state of the art crossing the planet has never known. My Gibraltar Strait crossing proposal consist in a suspended bridge that connects the 15Km of the Straits with a “ultra-long” central span of 10Km, based on a new type of suspended structure.

**Keywords:** Gibraltar Straits, ultra long spans bridge, hyperboloid at one sheet, net ropes.

### 1. Introduction

For more than twenty years, the governments of Spain and Morocco have been studied different hypothesis for crossing the Gibraltar Straits, that divide the African and the European continents (Fig.1). In 1991 professors T.Y.Lin and Chow, theoretically demonstrated the feasibility of the plan, even if only in theoretically level, proposing a solution consisting in a suspended bridge with two central 5000mt wide spans and two 2500mt wide lateral ones, as to cover the 15Km jump of the Strait. Lin and Chow proposed a bridge with three towers founded over the Strait depth, with the central



Fig.1 *Satellite view of the Gibraltar Strait*

tower rested on a approximately 400mt under the sea level cape.

In spite of the great effort needing to cover the distance between the two continental borders, any project that have been presented until now, does not show a really new system of suspension: we have always seen solutions that integrate, in a hybrid so-called system, the cable stayed with the suspended bridge.

We want instead to propose a new innovative static system: a tension-structural system that not only allows to stabilize the bridge against the effects of the wind but that also does not need the central tower (that would involve complex works of foundations rested on not really safe layers) and covers the straits with a single span of 10Km (Fig.4).

This structural scheme represents a new type of structural bridge system that can be used even for smallest spans.