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Conception and development of an optical methodology applied to long-distance measurement of suspension bridges dynamic displacement

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Abstract. This paper describes the conception and development of an optical system applied to suspension bridge structural monitoring, aiming real-time and long-distance measurement of dynamical three-dimensional displacement, namely, in the central section of the main span. The main innovative issues related to this optical approach are described and a comparison with other optical and non-optical measurement systems is performed. Moreover, a computational simulator tool developed for the optical system design and validation of the implemented image processing and calculation algorithms is also presented.