

### **1.5.29. THERMAL NON-DESTRUCTIVE CHARACTERIZATION OF THE SPHERICAL DEFECTS IN THE ROADWAYS**

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The structures of roadways become older and undergo degradations because of the vehicular traffic. To preserve them as long as possible, it is necessary to ensure a strategy of maintenance and adequate repair. So that such a strategy is effective, it is first of all necessary to carry out diagnoses of the roadways with an aim of identifying the problematic zones. Among the methods being able to ensure this diagnosis, there are the thermal methods of the non-destructive testing. They are based on the analysis of the temperature distribution on a surface, previously heated by heat flow density. This technique has several advantages, we can cite for example: the non-destructive character of the method; thermographical images can be remotely taken; the results can be exploited immediately without any former treatment and the simplicity of implementation.

In this work, to ensure the suitability of the thermal non-destructive testing in the characterization of defects in the semi rigid roadways structures. Numerical simulations in 3 dimensions are introduced. The influences of the size, the position and the thermophysical parameters of spherical defect, on the response of a semi rigid roadway structure to a thermal excitation are studied. The numerical method adopted for the resolution of this problem is based on the finite elements. After resolution of the problem, the thermophysical images and the temperature spatial distribution are analysed.