**PROBLEMS ASSOCIATED WITH THE CONTRAST BETWEEN THERMAL AND MECHANICAL PROPERTIES OF MATERIALS**

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The present work consists in the study of thermal and mechanical properties of a body consisting of the same volume of two materials with different thermal and mechanical properties,[1],[2] placed in physical contact. The materials are subjected to a common thermal source but, due to their density and specific thermal capacity, their temperatures will suffer different variations. This work studies the changes occurring near the contact zone of the two materials. In addition to different volume increases (pressure increases) in the two materials, different values of thermal conductivity must be considered and shear stresses of thermal origin, presenting different values in the two materials must be studied near the contact zone. The work consists of the study of the changes observed near the contact area of the two materials considering different values of heat supplied .Changes of thermal conductivity values with temperature are considered but variations with pressure increase are not considered.

The hypothesis of introducing a third element (water) into pre-existing cracks dilated with the initial heating is also studied. Special attention is given to the content of this third element as well as to the effect of the temperature increase in the body and the contact border between the two initial materials.

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REFERENCES

[1] Haenel, R., Rybach, L. and Stegena, L. (eds), (1988), Handbook of Terrestrial Heat-Flow Density determination, 499-453, Holland, Kluwer Academic Publishers.

[2] Turcotte, D.L., Schubert,G. (2002). Geodynamics (2nd ed.), New York, Cambridge University Press.