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STUDY OF NORMAL STRESSES IN DOUBLE POROSITY BORE

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Abstract: Normal stresses in a semi-infinite poroelastic wellbore (borehole) of double porosity solid are studied in the frame work of Biot′s isotropic poroelastic theory. The radial normal stress is computed against aspect ratio in the case of Berea sandstone saturated with water, and Berea sandstone saturated with kerosene. Graphical representation of numerical results is given and then analyzed. From the figures, it is noticed that normal stress curves are symmetric.

Keywords and Phrases: Borehole, double porosity, normal stress, aspect ratio.
2020 Mathematics Subject Classification: 00A69.

1. Introduction

Boreholes are used in the exploration of natural resources including oil, gas, water and minerals. The boreholes must be enclosed with appropriate material to improve its stability. It has to withstand against the stresses exerted by surrounding medium. Therefore, the radial normal stresses around the borehole must be