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SMECTITE DEHYDRATATION in COMPACTING SEDIMENTARY BASINS: a SOURCE of ADDITIONAL OVERPRESSURE

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Our study explains how 3D fluid pressure were computed for the first time, taking into account compaction law, fluid flow according to Darcy law, and a geochemical-thermodynamic model for smectite dehydration. Our calculations show that rich shale deposits could efficiently generate overpressure even if dehydration reaction releases no more with less than 5 moles of water per mole of smectite. Studying the Afam Shale formation of Niger Delta area illustrates how we have improved our ability to model overpressure as a result of including smectite dehydration coupled with mechanical compaction in a quantitative basin model.