Green Color – Silicon Dioxide

Blue Color – Silicon Nitride

Yellow Color – Chromium

Orange Color – Gold

Red – Polysilicon

Transparent – Air

Problem Statement –

Membrane made up of a stack of material as shown. A voltage is applied on the Gold side of the membrane while the electrode which is polysilicon is grounded. The goal of this simulation is to find both static as well transient simulation behavior of the membrane when different voltages are applied.

Setup –

To do this, a plain strain model, Moving Mesh (ALE) and electrostatic model were used. The membrane and electrode is fixed on the sides.

After creating model and the mesh in comsol 3.5a it was observed that the solution returned an error saying that the matrix was singular – error 7111.

Please suggest and correct if any errors are present