Abstract

Artificial lift is one of the artificial mechanisms for lifting petroleum. This mechanism is used when the oil cannot flow due to a decrease in pressure on the well hole. Sucker beam rod pump is one type of artificial lift. The research aims at analyzing the design of the pumping system based on stretching or displacement from the shaft rod. Dick rod is one component of the system of shaft rod pump which is located in mining wells. These rods function as a place for the dependence of oil. Displacement or stretch is modeled as a wave equation. Numerical calculations are performed to determine the sucker rod and displacement solutions. The solution of the same displacement at the next stage can be used as additional information for sucker rod beam pump operator to determine the condition of the rod in the well. In this research the Rayleigh Ritz method is used to determine the numeric solution of the equation, the function of B-Spline Base is used in the RayleighRitz method because the B-Spline Base function is more flexible in approaching solutions than linear functions. The basic function of B-Spline Basics is the function of Cubic Spline Interpolation. The solution obtained from this numerical calculation is a matrix that shows the extent of the sucker rod segment with time. The results obtained have L-1 errors 1.24×10^{-14} and L-2 error 1.08×10^{11}.