

1116-35-898

**Lihua Zuo\*** (lihuazuo@gmail.com) and **Wei Yu**. *A Fractional Decline Model for Shale Gas Reservoirs*.

In recent several decades, researchers have designed various Decline Curve Analysis (DCA) methods to simulate the flow rate changes. While all DCA methods could be used in some cases under some assumptions and limits, each has its disadvantages and failed cases. In this paper, based on the anomalous diffusion phenomena and long-tail behavior seen in most unconventional reservoirs, the authors proposed a novel Fractional Decline Model (FDM) by using the solutions for fractional diffusion equations. After introducing the mathematical background, the authors proposed the FDM and analyzed its asymptotic properties. Then the authors proposed a four steps scheme to determine the parameters in the FDM. The effectiveness of this method was compared with other existing methods (Arp's, Stretched Exponential Decline Model, Duong Model) for five wells in Fayetteville field. (Received September 15, 2015)