Pressure Diffusion @model

There is a large number of various pressure diffusion models.

Application-based classification

The table below shows a list of Pressure Diffusion @model components and corresponding popular models which in some cases can be simulated with analytical methods to speed up the calculations.

Wellbore storage	Well Trajectory	Well-Reservoir Contact	Reservoir	Boundary model
Constant	Vertical well	Skin-factor	Homogeneous	Unconstrained
Fair	Slanted well	Fractured vertical well	Dual-porosity	Infinite
Rate-dependant	Horizontal well	Limited entry well	Dual-permeability	Fully constrained
		Multifrac horizontal well	Anisotropic reservoir	Circle No Flow / Circle Constant P_i
			Multi-layer reservoir	Rectangular No Flow / Rectangular Constant P_i
			Linear-composite	Partially constrained
			Radial-composite	Single fault
				Parallel faults
				Intersecting Faults

There is a number of specific pressure diffusion models which represent the key practical scenarios of pressure diffusion and play important academical and practical role:

	Transient flow	Steady-State (SS) flow	Pseudo-Steady State (PSS) flow
Radial flow	Radial Flow Pressure Diffusion @model	Steady State Radial Flow Pressure Diffusion @model	Pseudo-Steady State Radial Flow Pressure Diffusion @model
Linear flow	Linear Flow Pressure Diffusion @model	Steady State Linear Pressure Diffusion @model	Pseudo-Steady State Linear Pressure Diffusion @model

Computation-based classification

The table below shows the popular pressure diffusion models categories based on computation specifics:

Number of phases	Number of wells	Equation Linearity	Computational Scheme	Spatial dimension
Single-phase	Single-well	Linear	Analytical	0D
Multi-phase	Multi-well	Pseudo-Linear	Numerical	1D
		Non-linear		2D
				3D

The usual combinations are:

Linear Analytical 1D	Pseudo-Linear Analytical 1D	Non-Linear Numerical 2D/3D
Single-phase Linear Analytical 1D	Single-phase Pseudo-Linear Analytical 1D	Single-phase Non-Linear Numerical 1D /2D/3D
Multi-phase Linear Analytical 1D	Multi-phase Pseudo-Linear Analytical 1D	Multi-phase Non-Linear Numerical 1D/2D/ 3D

In many practical cases a pressure diffusion process is honouring some PDE with constant coefficients availing a number of very efficient computational and diagnostic techniques:

Time Convolution	Spatial Superposition
Pressure convolution model	Pressure superposition model
Pressure deconvolution model	Pressure decomposition model

In some cases a pressure diffusion process can be fairly approximated by a hybrid model based on PDE with constant coefficients and PseudoPressure and PseudoTime.

See also

Physics / Mechanics / Continuum mechanics / Fluid Mechanics / Fluid Dynamics / Pressure Diffusion

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Well Testing / Pressure Testing

[Slightly Compressible Flow] [PseudoPressure] [PseudoTime]

[Radial Flow Pressure Diffusion @model] [Linear Flow Pressure Diffusion @model]