PTA Diagnostic Plot

Pressure log-log plot of unit-rate drawdown survey pressure drop $\delta p(t) = p_{wf}(0) - p_{wf}(t)$ and pressure log-derivative $p'(t) = t\,\frac{dp_{wf}}{dt}$ (see examples at Fig. 1 – Fig. 3).

Traditionally the pressure drop on pressure log-log plots is denoted by $p(t)$ which is the same as $\delta p(t)$: $p(t) = \delta p(t)$ but since it's a consistent practise it usually does not create a confusion among well test engineers.

The pressure log-derivative $p'(t)$ provides a zoomed insight into the pressure diffusion dynamics at different times which helps identifying the pressure diffusion model behind the pressure variation.

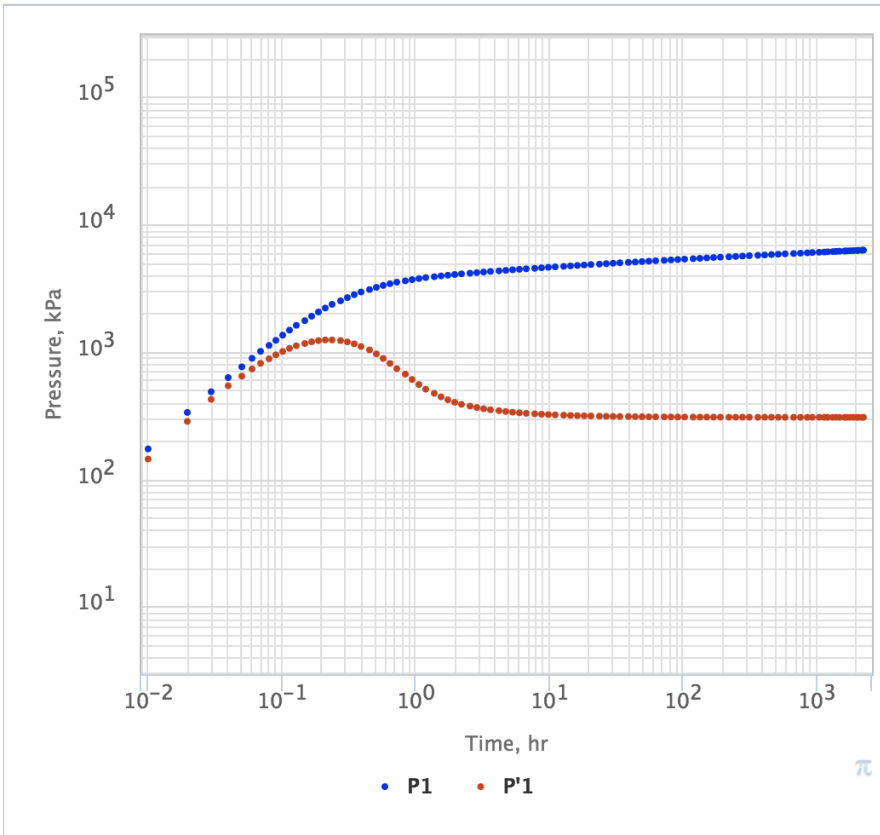

Fig. 1. PTA Diagnostic Plot for vertical well in single-layer homogeneous reservoir without boundaries (IARF).

Pressure drop is in blue and log-derivative is in red.

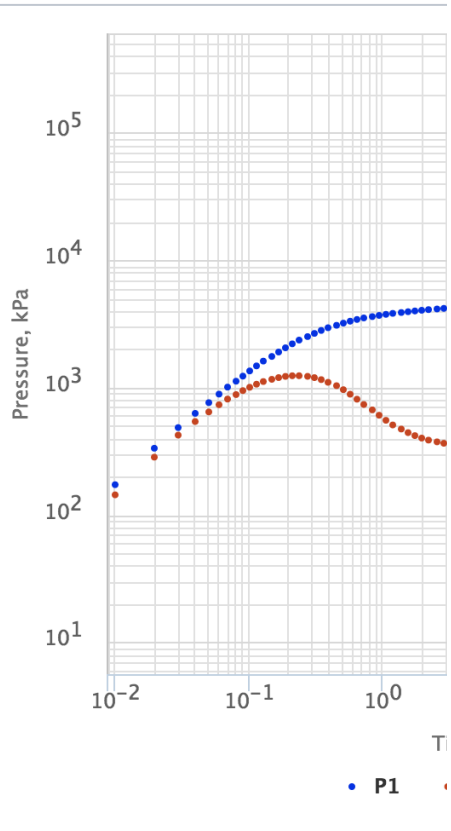

Fig. 2. PTA Diagnostic Plot for vertical w reservoir with impermeable circle bound

Pressure drop is in blue and log-derivati

See PTA Type Library for a wide range of typical PTA Diagnostic Plots.

The usual convention is to split pressure transient response in three major time intervals (see also **Fig. 4**):

Early Time Response (ETR)	Middle Time Response (MTR)	Late Time Response (LTR)

Wellbore storage and well-reservoir contact effects	Unconstrained reservoir flow	Reservoir boundary effects

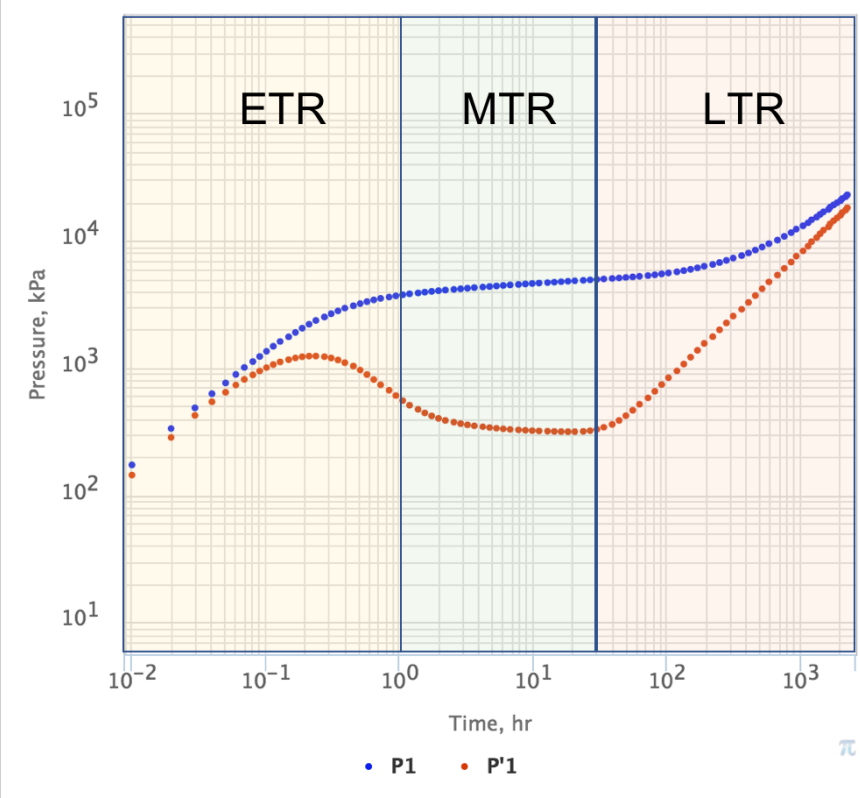

Fig. 4. PTA Diagnostic Plot with ETR, MTR and LTR time zones.

Pressure drop is in blue and log-derivative is in red.

See Also

Petroleum Industry / Upstream / Subsurface E&P Disciplines / Well Testing / Pressure Testing / Pressure Transient Analysis (PTA)

[Well & Reservoir Surveillance] [Pressure Diffusion] [PTA Type Library]