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EGU23-1804
Session: HS 8.1.5

EGU General Assembly

Supplementary Material

Global Sensitivity Analysis of Physical Non-equilibrium Contaminant Transport Model for Reactive Transport in a Saturated Porous System

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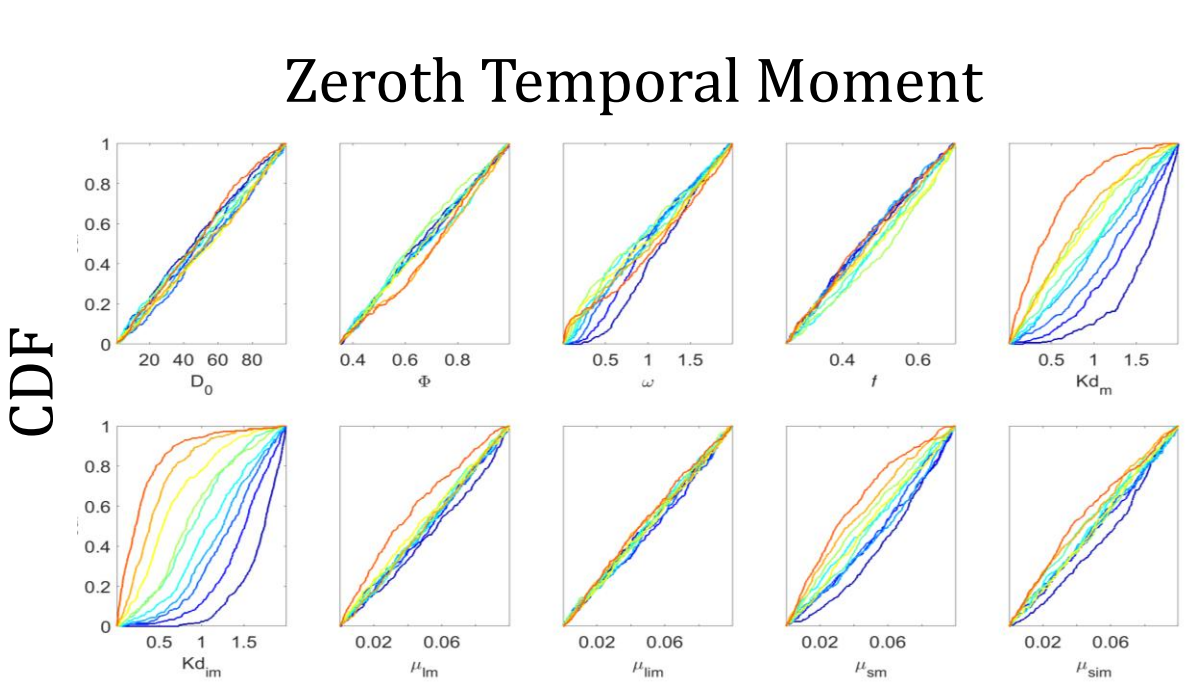
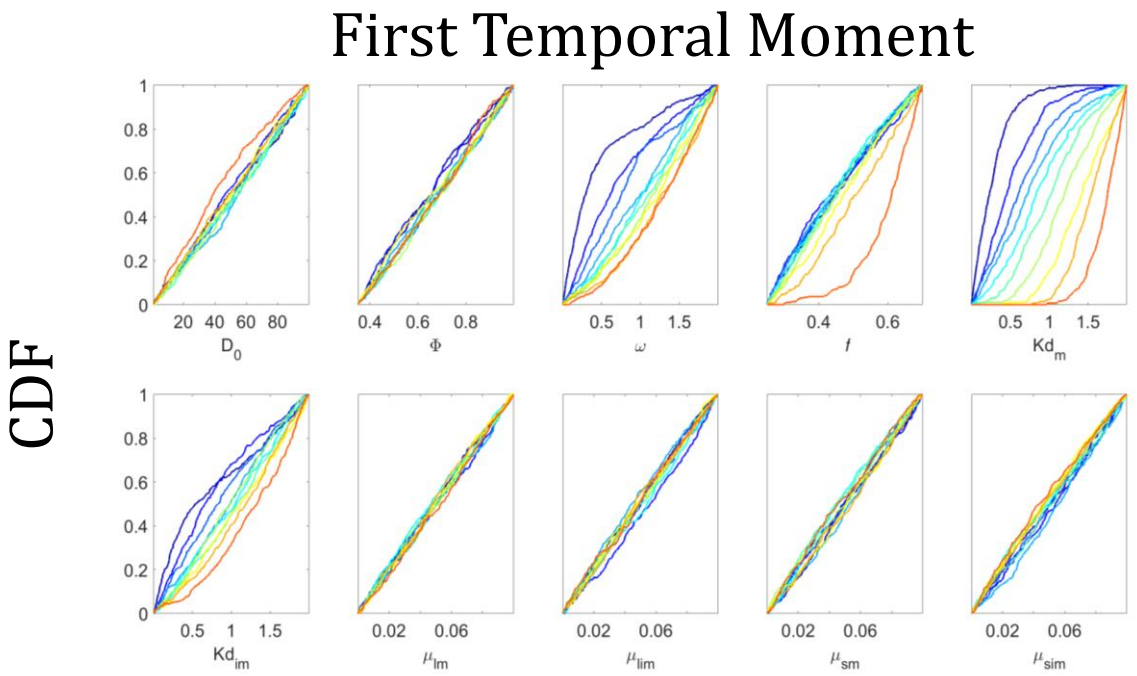
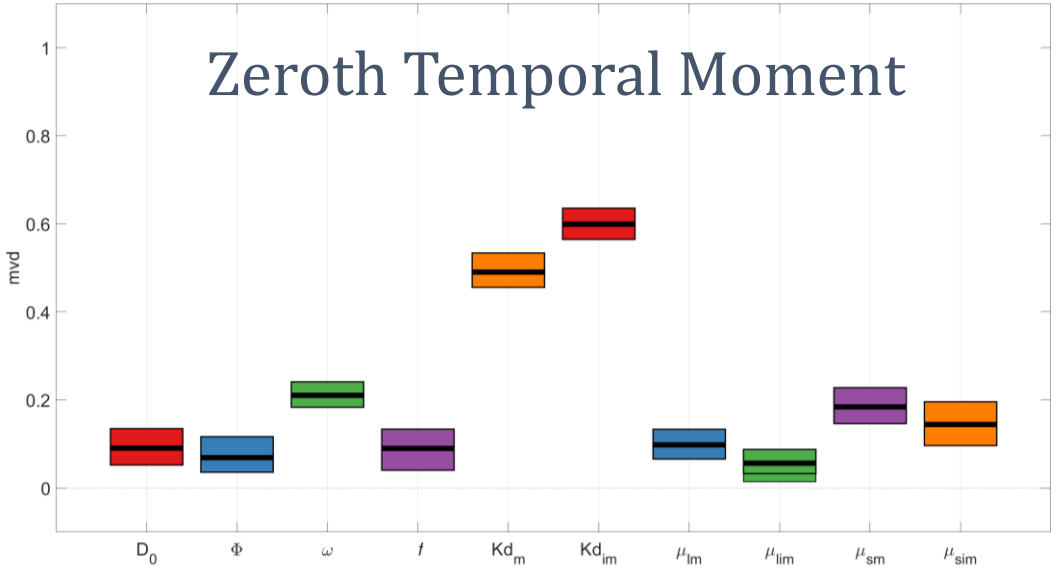
Preliminary Assessment of Sensitivity: Regional Sensitivity Analysis (RSA) Method





Results: RSA Method

RSA



RSA

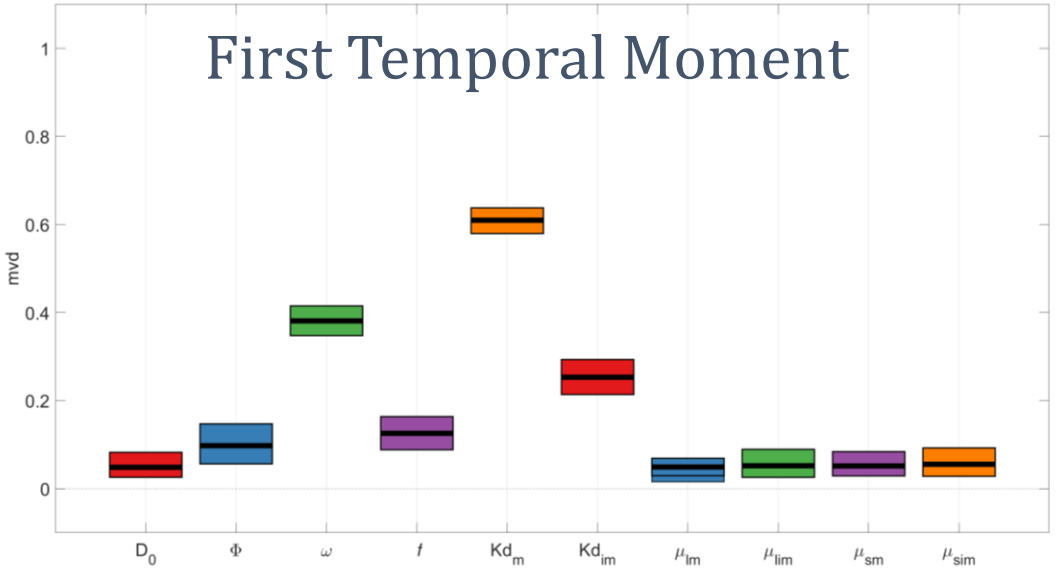
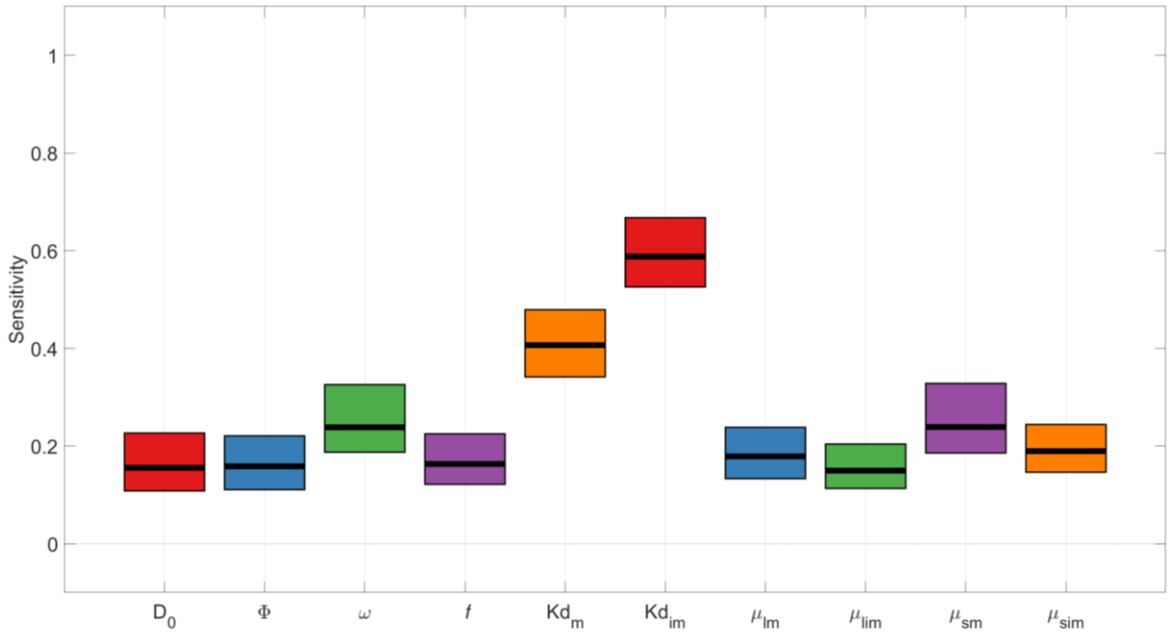


Table: Input parameters for GSA and associated uncertainty range

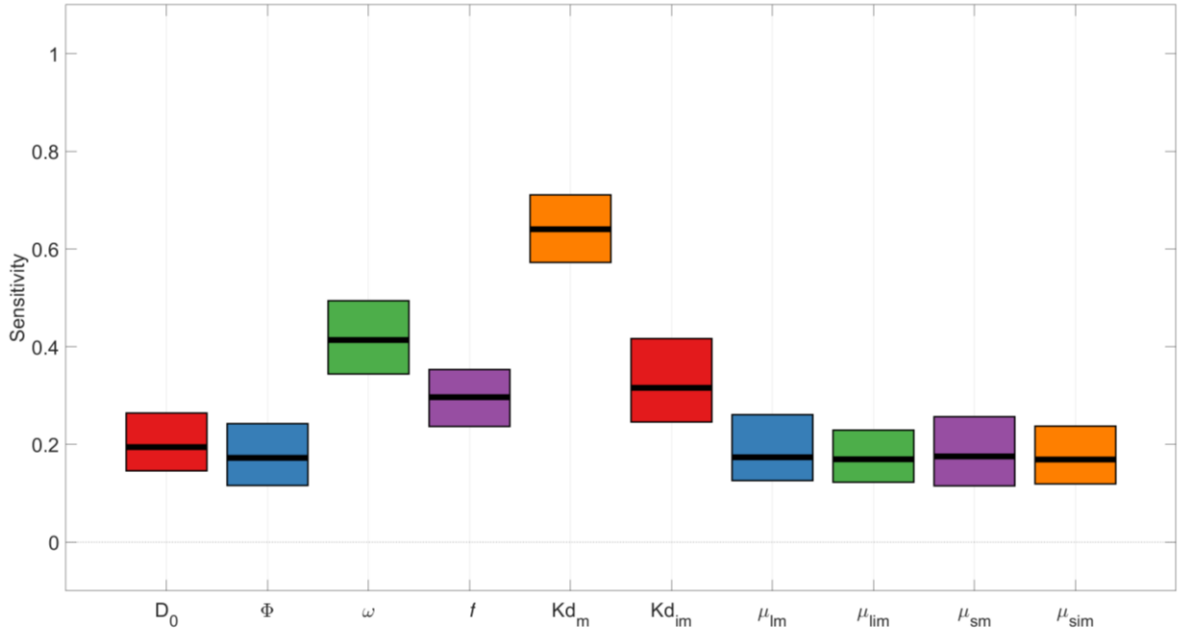
Model Parameter [Symbol]	**Unit**	**Range (min, max)**
Dispersion coefficient [D_0]	(cm^2/day)	(1, 100)
Ratio of mobile region fraction [$\phi = \theta_m/(\theta_m + \theta_{im})$]	-	(0.35, 0.999)
Mass transfer rate coefficient [ω]	(/day)	(0, 2)
Fraction of adsorption sites that equilibrate instantaneously with the mobile region [f]	-	(0.25, 0.70)
Sorption distribution coefficient in the mobile region [Kd_m]	$\left(\frac{cm^3}{g}\right)$	(0, 2)
Sorption distribution coefficient in the immobile region [Kd_{im}]	$\left(\frac{cm^3}{g}\right)$	(0, 2)
First-order decay coefficient for degradation of solute in the mobile liquid region [μ_{lm}]	(/day)	(0, 0.10)
First-order decay coefficient for degradation of solute in the immobile liquid region [μ_{lim}]	(/day)	(0, 0.10)
First-order decay coefficient for degradation of solute in the mobile adsorbed solid phase [μ_{sm}]	(/day)	(0, 0.10)
First-order decay coefficient for degradation of solute in the immobile adsorbed solid phase [μ_{sim}]	(/day)	(0, 0.10)

Results: PAWN Method

Zeroth Temporal Moment



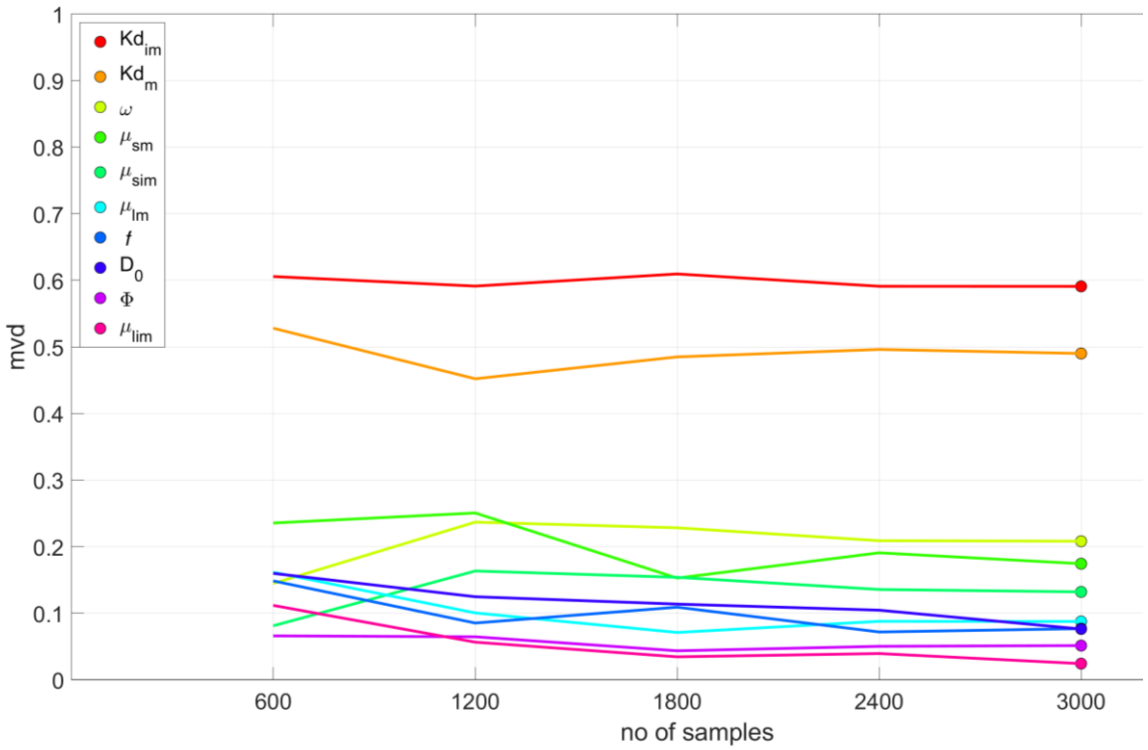
First Temporal Moment



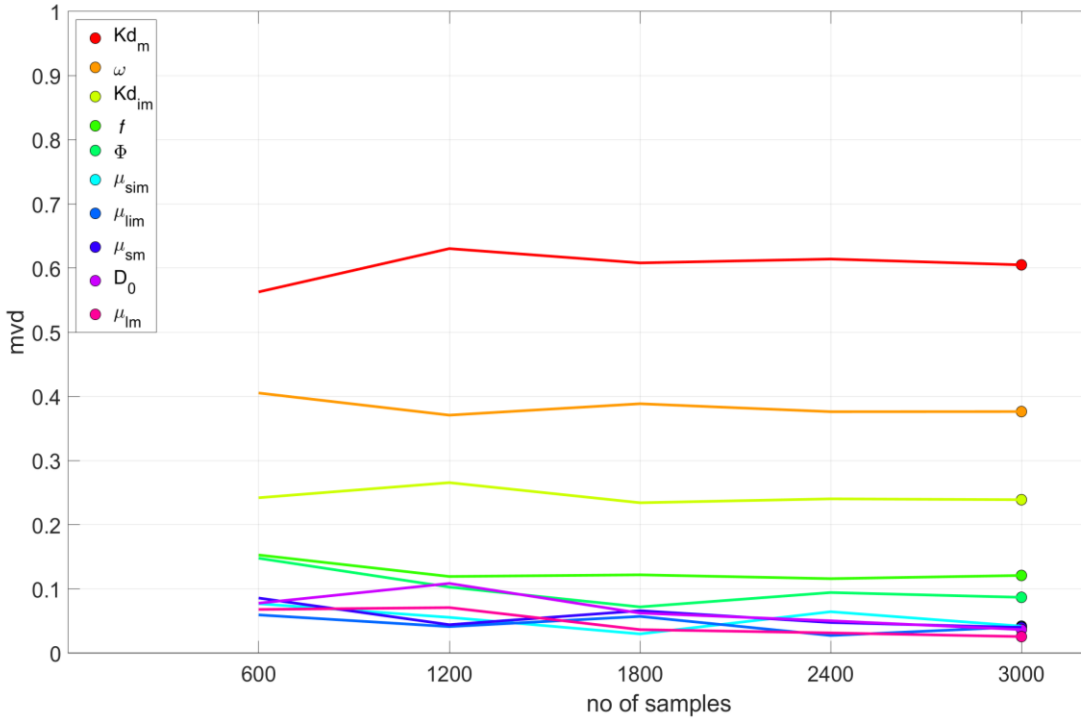
Efficiency of RSA method

RSA

Zeroth Temporal Moment



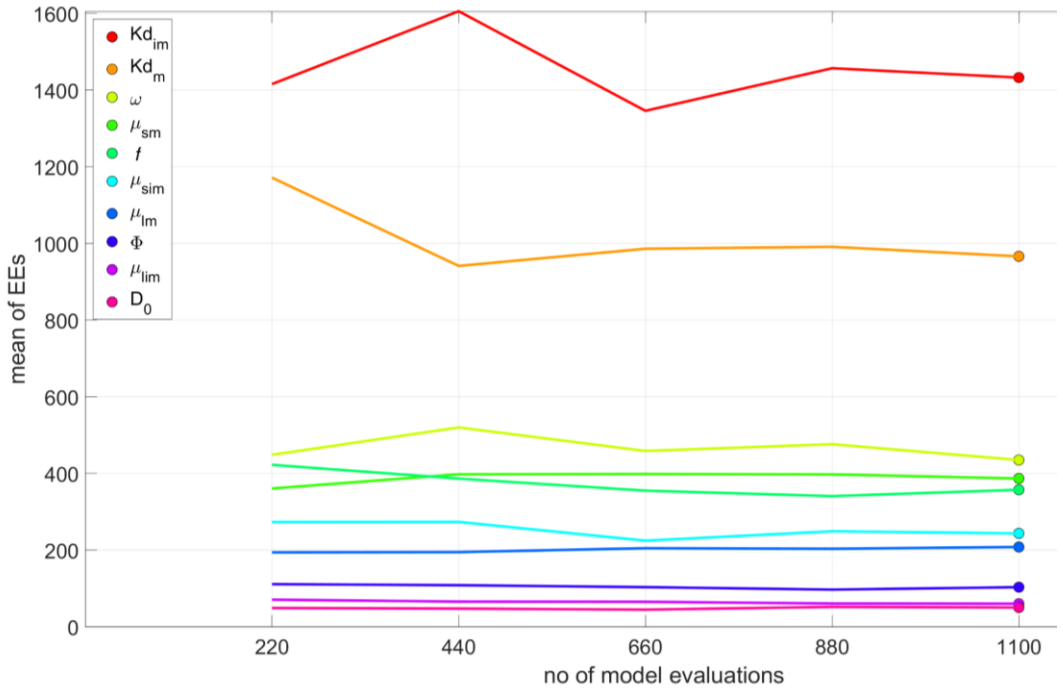
First Temporal Moment



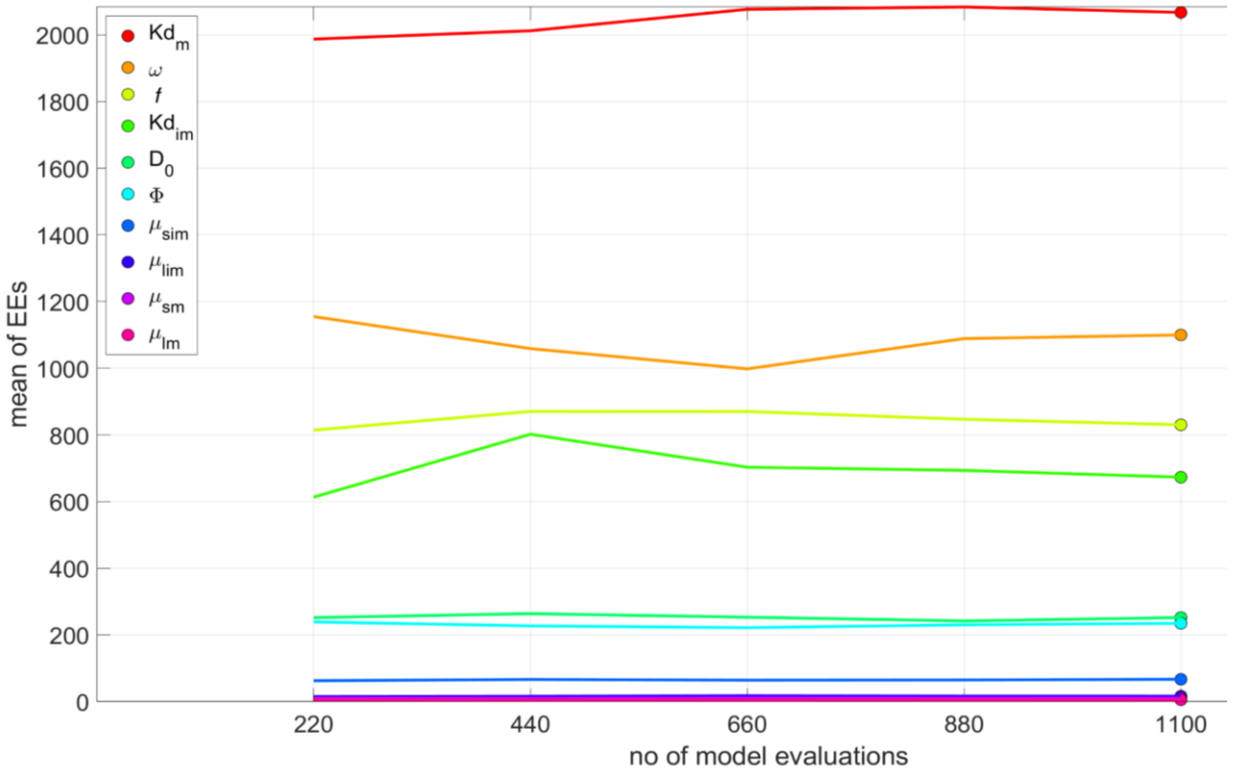
Efficiency of Morris method

Morris

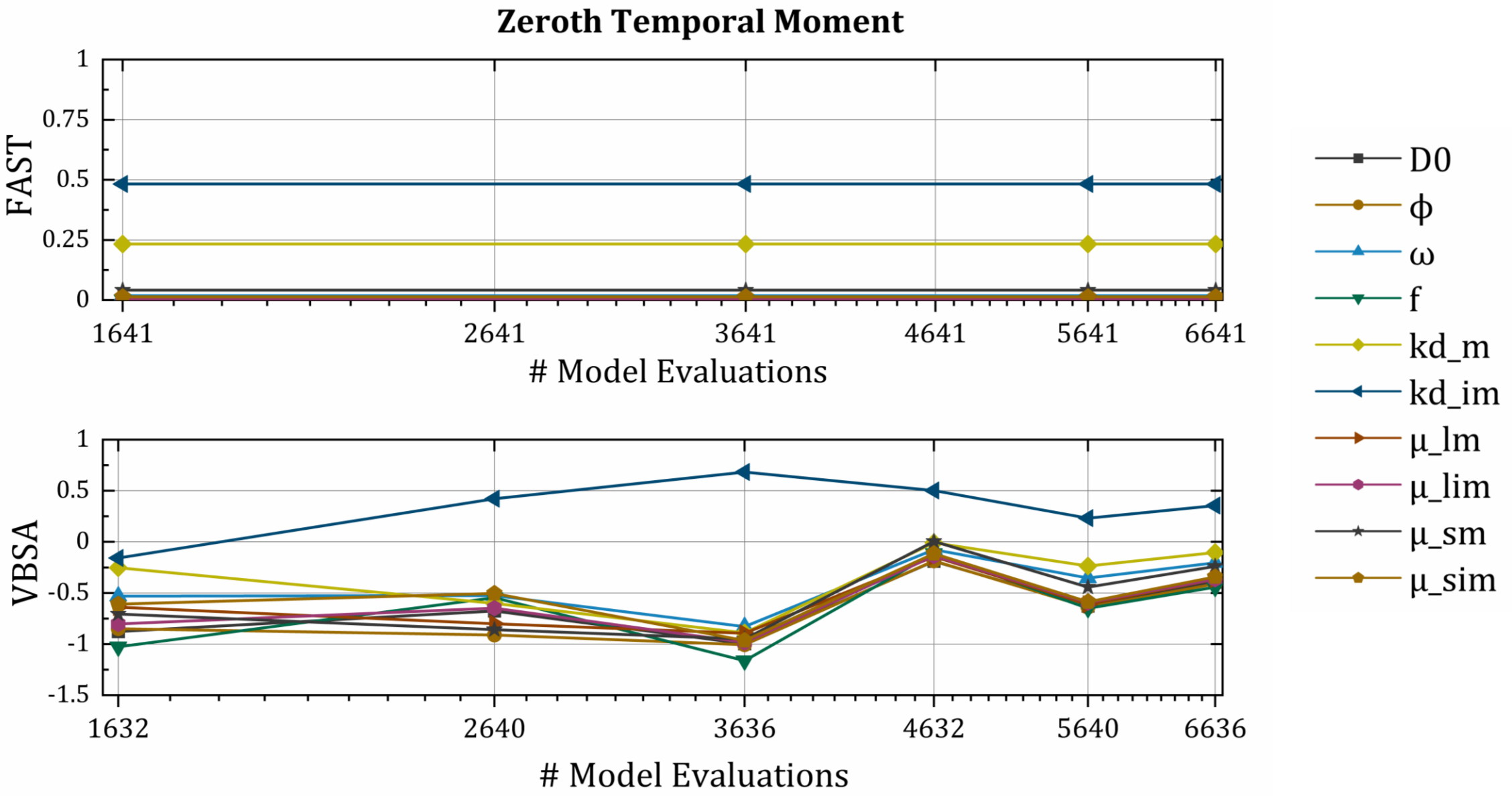
Zeroth Temporal Moment



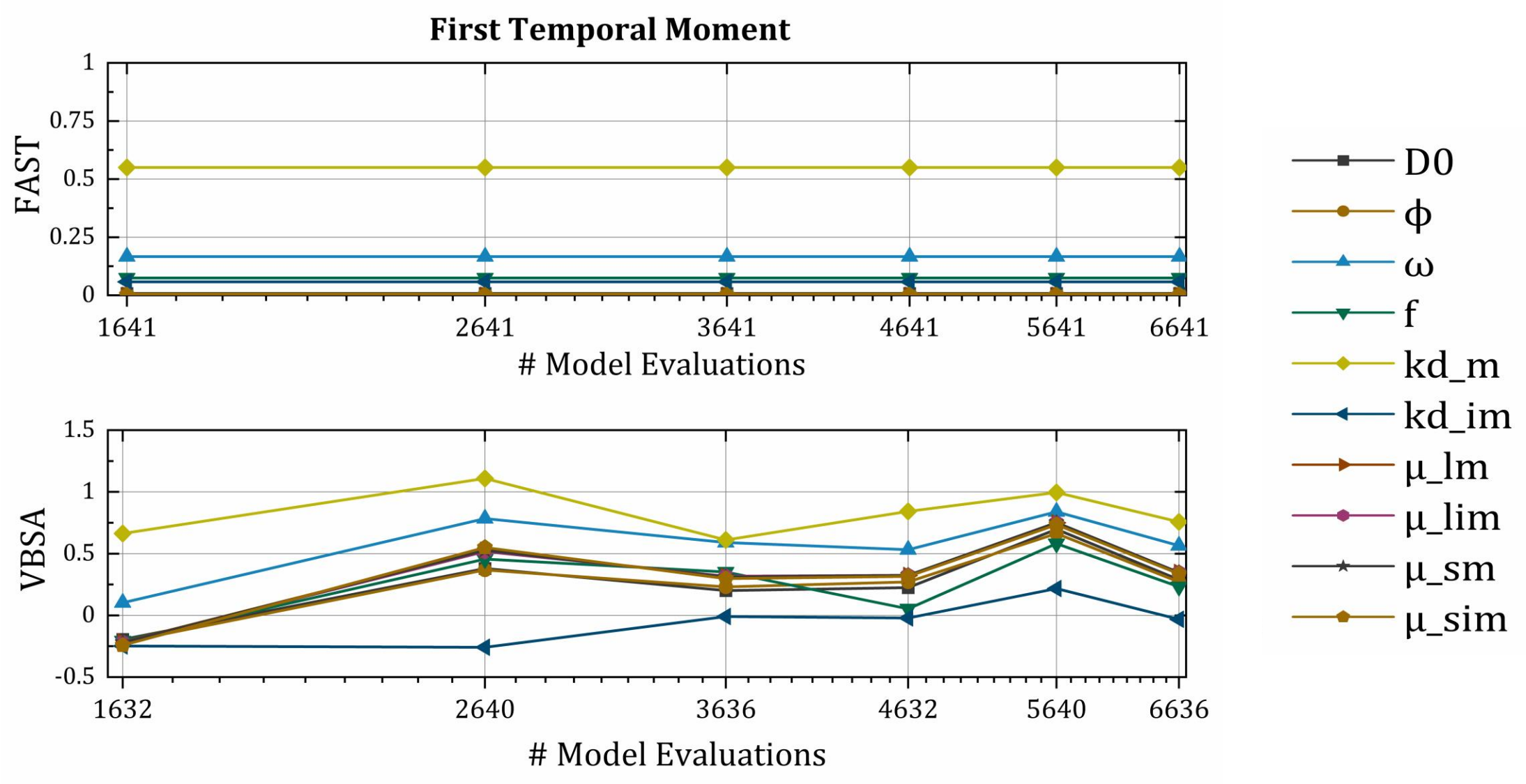
First Temporal Moment



Efficiency of FAST & VBSA methods

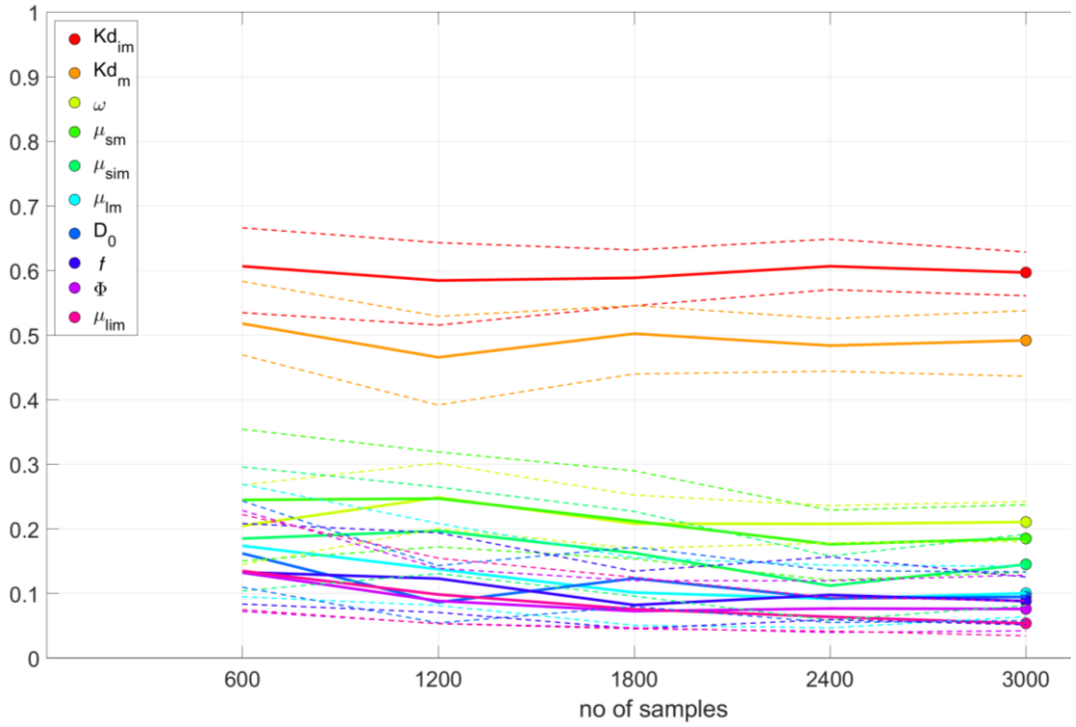


Efficiency of FAST & VBSA methods

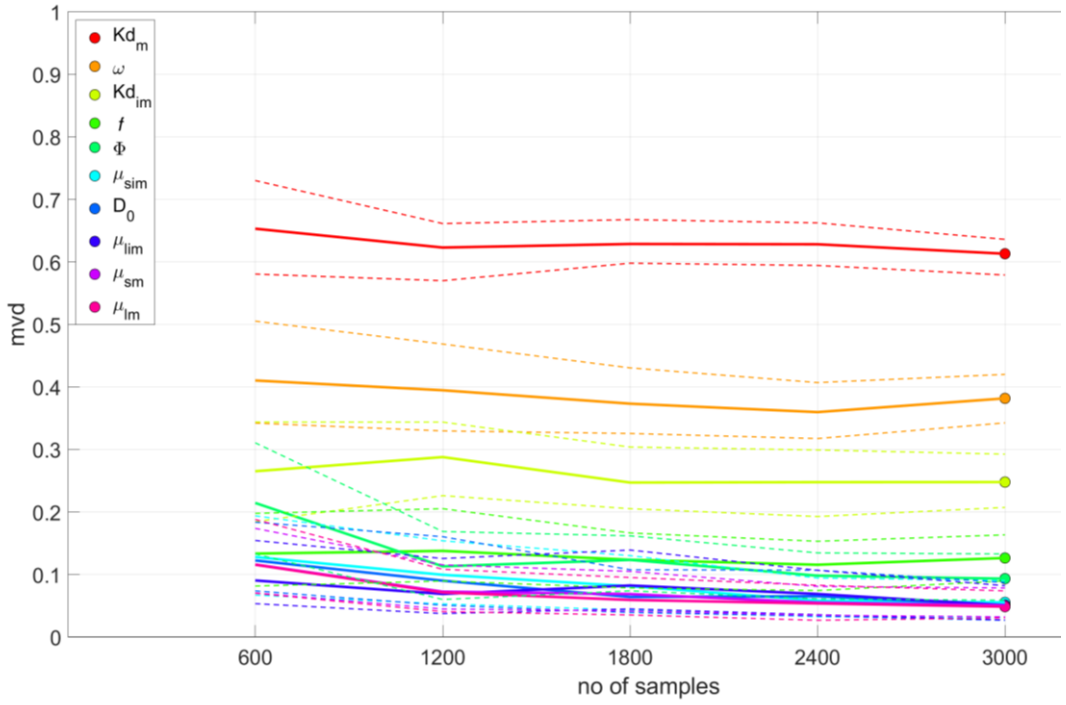


Convergence of RSA method

Zeroth Temporal Moment



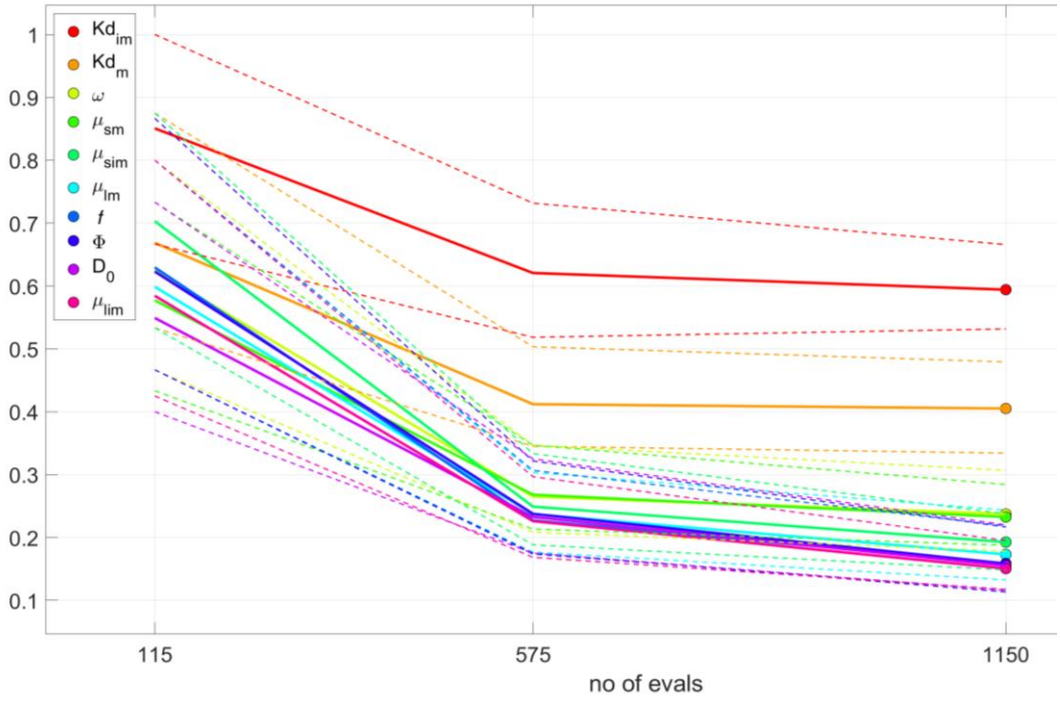
First Temporal Moment



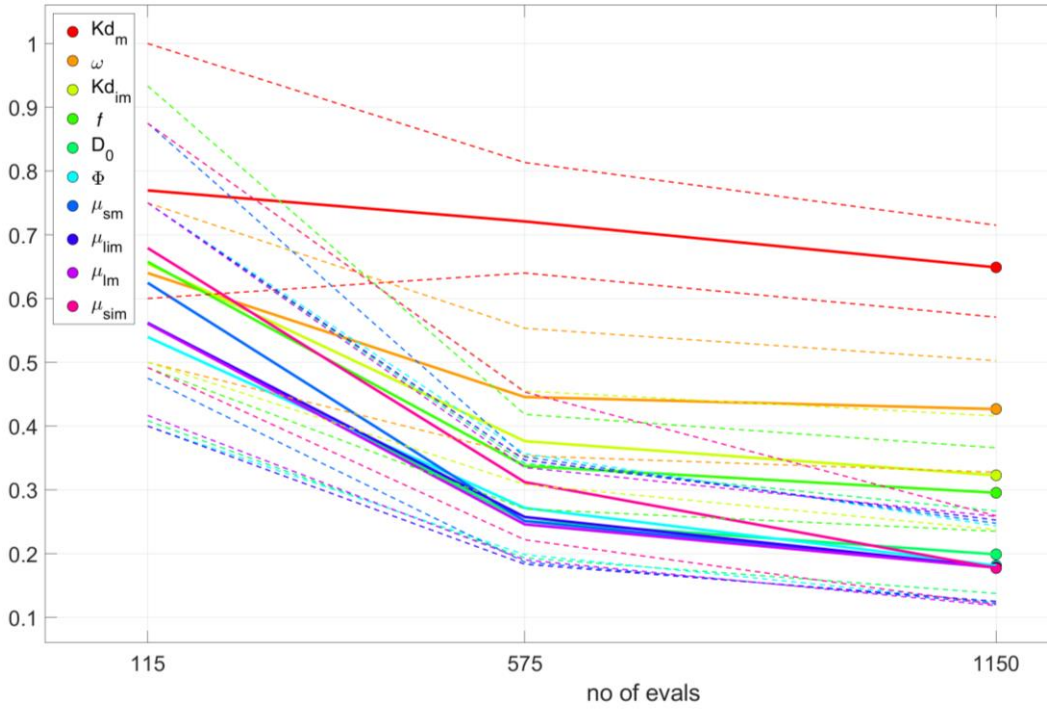
Estimate of mean and 95% Confidence Interval (CI) for Zeroth and First Temporal Moment

Convergence of PAWN method

Zeroth Temporal Moment



First Temporal Moment



Estimate of mean and 95% Confidence Interval (CI) for Zeroth and First Temporal Moment

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Thanks !

Questions? Suggestions?

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