Table 1. Literature on correlation and spatial correlation model development.

References	**Database/Region**[1]	**Spatial Correlation**	**Non-Spatial Correlation**	**Method**	**Intensity Measures**
Boore et al. [2003]	1994 Northridge earthquake	X	-	Analytical Formulations	PGA
Wang and Takada [2005]	Taiwan and Japan earthquakes	X	-	Analytical Formulations	PGV
Baker and Cornell [2006]	PEER Strong Motion (2000)	-	X	Analytical Formulations	$Sa(T) - Sa(T)$
Park et al. [2007]	1994 Northridge and 1999 Chi-Chi earthquakes	X	-	Analytical Formulations	$Sa(T)$
Goda and Hong [2008]	Chi-Chi and California earthquakes	X	X	Analytical Formulations	PGA, PGV, $Sa(T)$
Goda and Atkinson [2009]	K-net and KiK-net	X	X	Analytical Formulations	PGA, PGV, $Sa(T)$
Baker and Jayaram [2008]	NGA-W1 Database	-	X	Analytical Formulations	$Sa(T) - Sa(T)$
Jayaram and Baker [2009]	NGA-W1 Database	X	-	semivariograms	$Sa(T)$
Sokolov et al. [2010]	TSMP network in Taiwan	X	-	Analytical Formulations	PGA
Esposito and Iervolino [2011]	ESMD and ITACA	X	-	semivariograms	PGA, PGV
Bradley [2011a]	NGA-W1 Database	-	X	Analytical Formulation and Empirical Data	$Ds^2_{xy} - Sa(T)$, $Ds_{xy} - PGA$, $Ds_{xy} - PGV$ $Ds_{xy} - ASI$

[1] Region is described in case of Physics-Based Simulation being the methodology used.
[2] Ds_{575}, and Ds_{595} are applied.

Table 2. (continued)

References	Database	Spatial Correlation	Non-Spatial Correlation	Method	Intensity Measures
Bradley [2011a] (continued)	NGA-W1 Database	-	X	Empirical Formulations and Pearson's Correlation	$Ds_{xy} - SI$ $Ds_{xy} - DSI$ $Ds_{xy} - CAV$ $Ds_{575} - Ds_{595}$
Bradley [2011b]	NGA-W1 Database	-	X	Analytical Formulations	$Sa(T) - PGA$ $Sa(T) - ASI$ $Sa(T) - SI$
Bradley [2012]	NGA-W1 Database	-	X	Analytical Formulations	$Sa(T) - PGV$
Foulser-Piggott and Stafford [2012]	1994 Northridge and 1999 Chi-Chi earthquakes	X	-	semivariograms	Ia
Esposito and Iervolino [2012]	ESMD and ITACA	X	-	semivariograms	$Sa(T)$
Loth and Baker [2013]	NGA-W1 Database	X	-	Cross-semivariograms using LMC[3]	$Sa(T) - Sa(T)$
Sokolov and Wenzel [2013]	K-net and KiK-net	X	-	Analytical Formulations and semivariograms	PGA, PGV
Wang and Du [2013]	NGA-W1 Database	X	-	Cross-semivariograms using LMC	$PGA - PGV$, $PGA - CAV$, $PGV - CAV$, $Sa(T) - Sa(T)$
Du and Wang [2013]	NGA-W1 Database	X	-	semivariograms	$Sa(T)$
Cimellaro [2013]	ESMD	-	X	Analytical Formulations	$Sa(T)$

[3] linear model of coregionalization.

Table 2. (continued)

References	Database	Spatial Correlation	Non-Spatial Correlation	Method	Intensity Measures
Akkar et al. [2014]	RESORCE Database	-	X	Empirical Data	$Sa(T) - Sa(T)$, $Sa(T) - PGA$
Baker and Bradley [2017]	NGA-W2 Database	-	X	Empirical Data	$Sa(T) - Sa(T)$, $Sa(T) - PGA$, $Sa(T) - PGV$ $Sa(T) - Ds_{xy}$
Markhvida et al. [2018]	NGA-W2 Database	X	-	Cross-semivariograms using PCA[4]	$Sa(T) - Sa(T)$
Heresi and Miranda [2019]	NGA-W2 Database	X	-	Analytical Formulations	PGA, $Sa(T)$
Sgobba et al. [2019]	ITACA	X	-	Non-Ergodic ground motion model	PGA, $Sa(T)$
Stafford et al. [2019]	NGA-W2 Database	X	-	semivariograms	$Sa(T)$
Huang and Galasso [2019]	ESM and ITACA	X	X	Non-Ergodic ground motion model	PGA, PGV, $Sa(T)$ $Sa(T) - Sa(T)$, $Sa(T) - PGA$, $Sa(T) - PGV$
Chen and Baker [2019]	Southern California Area	X	-	Physics-Based Simulation	$Sa(T)$
Kuehn and Abrahamson [2020]	Taiwan and ANZA	X	-	Non-Ergodic ground motion model	PGA
Abbasnejadfard et al. [2020]	NGA-W2 Database	X	-	Cross-semivariograms using LD[5]	$Sa(T) - Sa(T)$, $PGA - PGV$, $PGA - PGD$, $PGV - PGD$
Heresi and Miranda [2021]	NGA-W2 Database	X	-	Empirical Data	$Sa_{avg}(T)$

[4] principal Component analysis methodology.

Table 2. (continued)

References	Database	Spatial Correlation	Non-Spatial Correlation	Method	Intensity Measures
Du and Ning [2021]	NGA-W2 Database	X	-	Cross-semivariograms using PCA	$Sa(T) - Sa(T)$, $Sa(T) - PGA$ $Sa(T) - PGV$, $Sa(T) - Ia$, $Sa(T) - CAV$, $Sa(T) - Ds_{xy}$, $PGA - PGV$, $PGA - Ia$, $PGA - CAV$, $PGA - Ds_{xy}$, $PGV - Ia$, $PGV - CAV$, $PGV - Ds_{xy}$, $Ia - CAV$, $Ia - Ds_{xy}$, $CAV - Ds_{xy}$
Schiappapietra and Smerzini [2021]	Central Italy Area	X	-	Physics-Based Simulation	$Sa(T)$
Infantino et al. [2021]	Italy, Istanbul and Greece Areas	X	-	Physics-Based Simulation	$Sa(T)$
Schiappapietra et al. [2022]	Italy	X	-	semivariograms	PGA, $Sa(T)$
Aldea et al. [2022]	Chilean earthquakes	X	-	Analytical Formulations	PGA, $Sa(T)$
Lin and Smerzini [2022]	Thessaloniki Area	X	-	Physics-Based Simulation	$Sa(T)$
Liu et al. [2023]	Ridgecrest Database	X	-	Non-Ergodic ground motion model	PGA
Bodenmann et al. [2023]	NGA-W2 Database	X	-	EAS model	$Sa(T)$

5 latent dimensions methodology.

Table 2. (continued)

References	Database	Spatial Correlation	Non-Spatial Correlation	Method	Intensity Measures
Tarbali et al. [2023]	NGA-W2 Database	-	X	Empirical Data	$PGV - Sa(T)$, $PGV - PGA$ $PGV - ASI$, $PGV - SI$, $PGV - DSI$, $PGV - CAV$, $PGV - Ia$, $PGV - Ds_{xy}$, $Sa(T) - Sa(T)$, $Sa(T) - Ds_{xy}$, $Sa(T) - CAV$, $Sa(T) - DSI$, $CAV - PGA$, $CAV - ASI$, $CAV - SI$, $CAV - DSI$, $CAV - Ia$, $CAV - Ds_{xy}$, $Ds_{xy} - PGA$, $Ds_{xy} - ASI$, $Ds_{xy} - SI$, $Ds_{xy} - DSI$, $Ds_{xy} - Ia$, $Ds_{575} - Ds_{595}$, $DSI - PGA$, $DSI - ASI$, $DSI - SI$, $DSI - Ia$
Zolfaghari and Forghani [2024]	Istanbul earthquakes	X	-	Non-Ergodic ground motion model	PGA, PGD, $Sa(T)$
Aristeidou et al. [2024]	NGA-W2 Database	-	X	Artificial Neural Networks	$Sa(T) - Sa(T)$, $Sa(T) - Ds_{xy}$ $Sa(T) - PGA$, $Sa(T) - PGV$

Table 2. (continued)

References	Database	Spatial Correlation	Non-Spatial Correlation	Method	Intensity Measures
Aristeidou et al. [2024] (continued)	NGA-W2 Database	-	X	Artificial Neural Networks	$Sa(T) - PGV$, $Sa(T) - FIV3$, $Sa(T) - Sa_{avg}(T)$, $Ds_{xy} - PGA$, $Ds_{xy} - PGV$, $Ds_{xy} - FIV3$, $Ds_{xy} - Sa_{avg}(T)$, $PGA - PGV$, $PGA - FIV3$, $PGA - Sa_{avg}(T)$, $PGV - FIV3$, $PGV - Sa_{avg}(T)$, $FIV3 - Sa_{avg}(T)$
Monteiro et al. [2025] (under review)	NGA-W2 and ESM Database	X	-	Cross-semivariograms using PCA	$Sa(T) - PGV$, $Sa(T) - FIV3$, $Sa(T) - Sa_{avg}(T)$, $Sa(T) - PGA$, $PGA - PGV$, $PGA - FIV3$, $PGA - Sa_{avg}(T)$, $PGV - FIV3$, $PGV - Sa_{avg}(T)$, $FIV3 - Sa_{avg}(T)$