

Feature	SeismoArtif	SeismoMatch	SeismoSelect
Primary Purpose	Artificial / synthetic ground-motion generation	Spectrum-compatible record matching	Intelligent ground-motion selection
Main Output	Artificial / synthetic accelerograms	Modified (spectrum-matched) real accelerograms	Selected sets of unmodified, real accelerograms
Uses Real Records	✗ No	✓ Yes (user-provided real records)	✓ Yes (records from curated global databases)
Directions	One (X)	One (X)	Three (X+Y+Z)
Artificial Record Generation	✓ Core functionality	✗ No	✗ No
Time-History Matching	✗ No	✓ High-accuracy time-history matching	✗ No
Record Selection	✗ No	✗ No	✓ Statistical selection & scaling
Target Spectrum Compatibility	Code-based or user-defined	Code-based or user-defined	Code-based or user-defined
Codes Supported	>30 codes (including EC8, ASCE 7, ASCE 41)	>30 codes (including EC8, ASCE 7, ASCE 41)	>30 codes (including EC8, ASCE 7, ASCE 41)
Preserves Non-stationarity	⚠ User-controlled (parametric)	✓ Largely preserved (modified records)	✓ Fully preserved (original records)
Preserves Physical Realism of Records	⚠ Average to Good	✓ Very Good	✓ Excellent
Near-Fault Pulse Control	✓ Parametric pulse modelling	⚠ Depends on input record	✓ Via database filtering
Soil / Site Class Targeting	✓ Parametric	⚠ Indirect	✓ Direct filtering
Magnitude–Distance Control	✓ Parametric	✗ No	✓ Explicit
Record-to-Record Variability	Fully user-controlled	Limited	Statistically consistent
Scaling / Spectral Fitting	✗ No	✓ Multi-objective	⚠ Optional scaling
Batch Processing	✓ Yes	✓ Yes	✓ Yes
Computational Demand	Low	Medium	Low
Typical Users	Practicing engineers, researchers	Advanced practitioners, researchers	Practicing engineers, researchers
Best Use Case	When no suitable real records exist and spectrum compatibility is mandatory	When suitable real records are available and spectrum compatibility is mandatory	When code-compliant and physically realistic real records are required