**Batch File Commands**

**fname1 fname2 query param**

|  |  |
| --- | --- |
| **KeyWord** | **Description** |
| **fname1** | filename of the seismichazard model or driving file, include extension |
| **fname2** | filename to write results. By default, a new file is created or replaced, include file extension. Add a “-“ sign before the filename to append results to an existing file. |
| **query** | String to specify the type of result. Available options are:   * uhs (uniform hazard spectra) * haz (scalar hazard curve at a single site) * hazm (IM at specified return periods for multiple sites. Suited for regional analysis, e.g., a million points in a grid) * vpsha (vector hazard surface) * cms (conditional mean spectra) * deagMR (magnitude-distance deaggregation of hazard) |
| **param** | List of parameters or entries specify to query type |

|  |  |
| --- | --- |
| **Query** | **Description** |
| **uhs** | **site htype Tret**   * site : site number as listed in Option 6 * htype : string (deag or mean), set to *deag* if the uhs shall be reported for all branches of the logic tree. Set to *mean* if only the mean UHS is required. * Tret : list of return periods for UHS calculations |
| **haz** | **site htype IM format**   * site : site number as listed in Option 6 * htype : string (deag or mean), set to *deag* if the uhs shall be reported for all branches of the logic tree. Set to *mean* if only the mean UHS is required. * IM : string indicating the intensity measure. Valid queries are: PGA,PGV,PGD,CAV,AI,VGI,SA(T=To),SV(T=To), SD(T=To),V/H(T=To), where To is a vibration period. * format: set to ‘auto’ (string) for automatic hazard curves generations. Or list the return periods on which the hazard curve is required, e.g., 50 100 250 500 1000… |
| hazm | **starget IM Tret**   * starget: this command specifies the sites on which the hazard is computed. Two different syntaxes are supported:   To compute IM in sites given in a list  **list ID1 ID2 ID3 … IDn**  To compute IM in a site ID range  **range ID\_initial ID\_final**   * IM : string indicating the intensity measure. Valid queries are: PGA,PGV,PGD,CAV,AI,VGI,SA(T=To),SV(T=To), SD(T=To),V/H(T=To), where To is a vibration period. * format: leave empty for automatic hazard curves generations. Or list the return periods on which the hazard curve is required, e.g., 50 100 250 500 1000… |

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| --- | --- |
| **vhaz** | site method branch IM1 IM2 gmc param   * site : site number as listed in Option 6 * method : string (BC2002,MVN,GaussCopula) * branch : branch number in the logic tree * IM1, IM2 : strings indicating the intensity measure. Valid queries are: PGA,PGV,PGD,CAV,AI,VGI,SA(T=To),SV(T=To),SD(T=To), V/H(T=To), where To is a vibration period. * gmc : ground motion correlation structure * param : additional parameters of gmc |
| **cms** | site method branch Tret Tcond scentype gmc param   * site : site number as listed in Option 6 * method : string (medthod1,method2,method3) * branch : branch number in the logic tree * Tret : return period * Tcond : conditioning period * scentype : string (mean,mode) * gmc : ground motion correlation structure * param : additional parameters of gmc |
| **deagMR** | **site Tret branch IM**   * site : site number as listed in Option 6 * Tret : return period * branch : branch number in the logic tree * IM : string indicating the intensity measure. Valid queries are: PGA,PGV,PGD,CAV,AI,VGI,SA(T=To),SV(T=To), SD(T=To),V/H(T=To), where To is a vibration period. |

|  |
| --- |
| point1 label mech style RA sRA gmmptr strike dip vertices  point2 label mech style gmmptr hypocenter vertices  line1 label mech style RA sRA gmmptr dip lmax nref vertices  area1 label mech style RA sRA gmmptr length lmax nref davg bc vertices  area1 label mech style RA sRA gmmptr dip usd lsd lmax nref davg bc vertices  area1 label mech style RA sRA gmmptr davg bc matfile  area2 label mech style RA sRA gmmptr strike dip length width aratio dx vertices  volume1 label mech style RA sRA gmmptr lmax nref thick slices vertices |

**Point1 Source Object**: Used to concentrate the seismicity in a single point in space. The orientation of the rupture plane is specified using the strike and dip angles. This source object uses circular rupture area.

|  |  |
| --- | --- |
| point1 label mech style RA sRA gmmptr strike dip vertices | |
| label | unique source label |
| mechanism | Tectonic setting   * interface * intraslab * crustal |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| RA | Rupture area (RA) handle   * null, wc1994,ellsworth, hanksbakun2001, somerville1999, wc1994r, wc1994s, strasser2010 |
| sRA | Rupture area uncertainty switch   * 0 (no uncertainty in RA model) * 1 (uncertainty considered in RA model) |
| gmmptr | Pointer to GMM object |
| strike | Strike angle (°) |
| dip | Dip Angle (°) |
| vertices | lon1 lat1 elev1 –or- X1 Y1 Z1 |

**Point2 Source Object**: Used to concentrate the seismicity in a single point in space with a user-defined rupture plane.

|  |  |
| --- | --- |
| point2 label mech style gmmptr hypocenter vert\_rp | |
| label | unique source label |
| mechanism | Tectonic setting   * Interface (1) * Intraslab (2) * Crustal (3) * Unknown (4) |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| gmmptr | Pointer to GMM object |
| hypocenter | Location of hypocenter  lon1 lat1 elev1 –or- X1 Y1 Z1 |
| Vert\_rp | Location of nodes defining the rupture plane  lon1 lat1 elev1 lon2 lat2 elev2 … lon\_n lat\_n elev\_n  -or- X1 Y1 Z1 X2 Y2 Z2 … X\_n Y\_n Z\_n |

**Line Source Object**: Used to concentrate the seismicity along 3D line. The line source object handles single or multiple line segments. The orientation of the rupture plane is defined by the line vertices and the specified dip angle. This source object uses circular rupture area.

|  |  |
| --- | --- |
| line1 label mechanism style RA sRA gmmptr dip lmax nref vertices | |
| label | unique source label |
| mechanism | Tectonic setting   * interface * intraslab * crustal |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| RA | Rupture area (RA) handle   * null, wc1994,ellsworth, hanksbakun2001, somerville1999, wc1994r, wc1994s, strasser2010 |
| sRA | Rupture area uncertainty switch   * 0 (no uncertainty in RA model) * 1 (uncertainty considered in RA model) |
| gmmptr | Pointer to GMM object |
| dip | Dip Angle (°) |
| lmax | Maximum length (km) of line segments used in the discretization |
| nref | Number of mesh refinements |
| vertices | lon1 lat1 elev1 lon2 lat2 elev2 … lon\_n lat\_n elev\_n  -or- X1 Y1 Z1 X2 Y2 Z2 … X\_n Y\_n Z\_n |

**Area1 Source Object**: source geometry defined by a 3D polygon. This source object uses circular rupture area with leaking boundaries.

|  |  |
| --- | --- |
| area1 label mechanism style RA sRA gmmptr lenght lmax nref davg bc vertices  area1 label mechanism style RA sRA gmmptr dip usd lsd lmax nref davg bc vertices  area1 label mechanism style RA sRA gmmptr davg bc matfile | |
| Label | unique source label |
| mechanism | Tectonic setting   * interface * intraslab * crustal |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| RA | Rupture area (RA) handle   * null, wc1994,ellsworth, hanksbakun2001, somerville1999, wc1994r, wc1994s, strasser2010 |
| sRA | Rupture area uncertainty switch   * 0 (no uncertainty in RA model) * 1 (uncertainty considered in RA model) |
| gmmptr | Pointer to GMM object |
| length | Source length along strike. For irregular sources, set it to the average length |
| lmax | Maximum length (km) of mesh edges used in the discretization |
| nref | Number of mesh refinements |
| davg | Average distance between source sampling points, set this factor to zero of the hazard is to be computed at every centroid within the source mesh. |
| bc | (string) Rupture area boundary type:   * leak * rigid |
| vertices | lon1 lat1 elev1 lon2 lat2 elev2 … lon\_n lat\_n elev\_n  -or- X1 Y1 Z1 X2 Y2 Z2 … X\_n Y\_n Z\_n |
| dip | Dip angle (°) |
| usp | Upper Seismogenic Depth (km) , positive value for points below the earth surface |
| lsd | Lower Seismogenic Depth (km), positive value for points below the earth surface |
| matfile | file\_name.mat  The mat file containing the source geometry is a structure with the following fields:  vertices: [Enodes × 3] (edge node coordinates)  conn: [Nelem × 3] (element connectivity matrix)  xyzm: [Nnodes × 3] (mesh nodes, including edges)  aream: [Nelem × 1] (area of elements)  hypm: [Nelem × 3] (centroid coordinates)  normal: [Nelem × 3] (unit vector normal to each element)  Notation: Enodes is the number of edge nodes, Nelem is the number of triangular elements in the Delaunay triangularization, Nnodes is the number of nodes in the triangularization. |

**Area2 Source Object**: Rectangular source defined by the strike and dip angles, length, width, and the location of vertices. This area object uses rectangular rupture area with user specified aspect ratio

|  |  |
| --- | --- |
| Area2 label mechanism style RA sRA gmmptr strike dip length width aratio dx vertices | |
| label | unique source label |
| mechanism | Tectonic setting   * interface * intraslab * crustal |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| RA | Rupture area (RA) handle   * null, wc1994,ellsworth, hanksbakun2001, somerville1999, wc1994r, wc1994s, strasser2010 |
| sRA | Rupture area uncertainty switch   * 0 (no uncertainty in RA model) * 1 (uncertainty considered in RA model) |
| gmmptr | Pointer to GMM object |
| Strike | Strike Angle |
| Dip | Dip angle (°) |
| Length | Length along strike(km) |
| Width | Length along Width (km), if unknown set to -999 |
| aratio | Rupture length to rupture width ratio |
| dx | Maximum distance between rupture area positions |
| vertices | lon1 lat1 elev1 -or- X1 Y1 Z1 |

**Volume1 Source Object**: Used to model seismicity distributed in a volume. The volume geometry is defined by a reference plane and the thickness perpendicular to the plane. The volume is formed by discretizing the reference plane and extruding the mesh along the normal to the plane in one thickness along the z-vector, see Figure x.

|  |  |
| --- | --- |
| Volume1 label mechanism style RA sRA gmmptr lmax nref thick slices vertices | |
| label | unique source label |
| mechanism | Tectonic setting   * interface * intraslab * crustal |
| style | Style of faulting (integer, double or string)   * -999 (if mechanism is unspecified) * rake angle (°) * strike-slip, reverse/oblique, reverse, normal/oblique, or normal |
| RA | Rupture area (RA) handle   * null, wc1994,ellsworth, hanksbakun2001, somerville1999, wc1994r, wc1994s, strasser2010 |
| sRA | Rupture area uncertainty switch   * 0 (no uncertainty in RA model) * 1 (uncertainty considered in RA model) |
| gmmptr | Pointer to GMM object |
| lmax | Maximum length (km) of mesh edges used in the discretization |
| nref | Number of mesh refinements in the reference place |
| thick | Thickness (km) |
| slices | Number of slices in the normal direction |
| vertices | lon1 lat1 elev1  or  X1 Y1 Z1 |

|  |  |
| --- | --- |
| delta label stype svalue Mchar | |
| label | unique source label |
| stype | Seismic Productivity Type (string)   * NM * SR |
| svalue | Number of events per year above MMin  Slip rate in units of mm/yr |
| Mchar | Characteristic Magnitude |

|  |  |
| --- | --- |
| truncexp label stype svalue bvalue MMin MMax sigmab sigmaMMax | |
| label | unique source label |
| stype | Seismic Productivity Type (string)   * NM * SR |
| svalue | Number of events per year above MMin  Slip rate in units of mm/yr |
| bvalue | Slope of log(lambdaM) vs M |
| MMin | Minimum Magnitude |
| MMax | Maximum Magnitude |
| sigmab | Standard deviation of b-value (Gamma pdf), set to 0 if no uncertainty is considered |
| sigmaMMax | Standard deviation of MMax (Uniform pdf) , set to 0 if no uncertainty is considered |

|  |  |
| --- | --- |
| truncnorm label stype svalue MMin MMax Mchar sigmaMChar | |
| label | unique source label |
| stype | Seismic Productivity Type (string)   * NM * SR |
| svalue | Number of events per year above MMin  Slip rate in units of mm/yr |
| MMin | Minimum Magnitude |
| MMax | Maximum Magnitude |
| Mchar | Characteristic Magnitude (MMin<Mchar<MMax) |
| sigmaMChar | Standard deviation of MChar (normal pdf) |

|  |  |
| --- | --- |
| yc1985 label stype svalue bvalue MMin Mchar | |
| label | unique source label |
| stype | Seismic Productivity Type (string)   * NM * SR |
| svalue | Number of events per year above MMin  Slip rate in units of mm/yr |
| bvalue | Slope of log(lambdaM) vs M |
| MMin | Minimum Magnitude |
| Mchar | Characteristic Magnitude (MMin<Mchar-0.25) |

|  |  |
| --- | --- |
| magtable label Mmin binwidth occurrates **DISCONTINUED** | |
| label | unique source label |
| MMin | Minimum Magnitude |
| binwidth | Magnitude bin width |
| occurrates | Mean rate of occurrence for each magnitude |

|  |  |
| --- | --- |
| catalog label filename FDsup FDinf | |
| Label | unique source label |
| filename | Earthquake catalog (\*.mat or \*.csv) |
| FDsup | Upper depth |
| FDinf | Lower depth |

Known Limitations

* Ill posed automatic triangulation may occur in highly warped **area1** source objects.
* If a conditional model uses style-of-fault as an input parameter, it must be specified in the GMM declaration, i.e., no automatic definition of SOF. However, the conditioning GMM can have a SOF set to ‘auto’.

**gmm Object**: The gmm command is used to create/add a ground motion model to the ground motion library.

|  |  |
| --- | --- |
| gmm label handle <usp> | |
| label | unique ground motion model |
| handle | String containing the name of the m-file that executes the ground motion model. |
| usp | user specific parameters, specific to each gmm |

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| --- | --- |
| **Youngs1997 mechanism** | |
| mechanism | * interface * intraslab |

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| --- | --- |
| **AtkinsonBoore2003 mechanism region** | |
| mechanism | * interface * intraslab |
| region | * general * cascadia * japan |

|  |  |
| --- | --- |
| **Zhao2006 mechanism** | |
| mechanism | * interface * intraslab * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **Mcverry2006 mechanism rvol** | |
| mechanism | * interface * intraslab * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| rvol | Length in km of the source-to-site path in the volcanic zone |

|  |
| --- |
| **ContrerasBoroschek2012** |

|  |  |
| --- | --- |
| **BCHydro2012 mechanism arc DeltaC1** | |
| mechanism | * interface * intraslab |
| arc | * forearc * backarc * unknown |
| DeltaC1 | * lower * central * upper * none |

|  |  |
| --- | --- |
| **BCHydro2018 mechanism** | |
| mechanism | * interface * intraslab |

|  |  |
| --- | --- |
| **Kuehn2020 mechanism region AlfaBackArc AlphaNankai Z10 Z25 Nepist** | |
| mechanism | * interface * intraslab |
| region | * global * aleutian * alaska * cascadia * central\_america\_s * central\_america\_n * japan\_pac * japan\_phi * new\_zealand\_n * new\_zealand\_s * south\_america\_n * south\_america\_s * taiwan\_w * taiwan\_e |
| **AlfaBackArc** | Fraction of Rrup in Backarc |
| **AlphaNankai** | Fraction of Rrup in Nankai Region (Japan only) |
| **Z10** | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| **Z25** | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| **Nepist** | Samples in Epistemic Uncertainty (0=none or 100-800) |

|  |  |
| --- | --- |
| **Arteta2018 arc** | |
| arc | * forearc * backarc |

|  |  |
| --- | --- |
| **Idini2016 mechanism spectype** | |
| mechanism | * interface * intraslab |
| spectype | * sI * sII * sIII * sIV * sV * sVI |

|  |  |
| --- | --- |
| **MontalvaBastias2017 mechanism arc** | |
| mechanism | * interface * intraslab |
| arc | * forearc * backarc * unknown |

|  |  |
| --- | --- |
| **MontalvaBastias2017HQ mechanism arc** | |
| mechanism | * interface * intraslab |
| arc | * forearc * backarc * unknown |

|  |  |
| --- | --- |
| **Montalva2018 mechanism** | |
| mechanism | * interface * intraslab |

|  |  |
| --- | --- |
| **SiberRisk2019 mechanism** | |
| mechanism | * interface * intraslab |

|  |  |
| --- | --- |
| **Garcia2005 component** | |
| component | * horizontal * vertical |

|  |
| --- |
| **Jaimes2006** |

|  |  |
| --- | --- |
| **Jaimes2015 station** | |
| Station | * cu * sct * cdao |

|  |
| --- |
| **Jaimes2016** |

|  |  |
| --- | --- |
| **GarciaJaimes2017 component** | |
| component | * interface * intraslab |

|  |
| --- |
| **GarciaJaimes2017HV** |

|  |  |
| --- | --- |
| **Bernal2014 mechanism** | |
| mechanism | * interface * intraslab |

|  |  |
| --- | --- |
| **Sadigh1997 SOF** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **I2008 SOF** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **CY2008 Z10 SOF event VS30type** | |
| **Z10** | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| event | * mainshock * foreshock |
| Vs30type | * measured * inferred |

|  |  |
| --- | --- |
| **BA2008 SOF** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **CB2008 Z25 SOF sigmatype** | |
| Z25 | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| sigmatype | * arbitrary * average |

|  |  |
| --- | --- |
| **AS2008 Z10 SOF event Vs30type** | |
| Z10 | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| event | * aftershock * mainshock * foreshock * swarms |
| Vs30type | * measured * inferred |

|  |  |
| --- | --- |
| **AS1997h SOF location sigmatype** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| location | * hangingwall * footwall |
| sigmatype | * arbitrary * average |

|  |  |
| --- | --- |
| **I2014 SOF** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **CY2014 Z10 SOF Vs30type region** | |
| Z10 | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| VS30type | * measured * inferred |
| region | * global * california * japan * china * italy * turkey |

|  |  |
| --- | --- |
| **CB2014 Z25 SOF HWeffect region** | |
| Z25 | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| HWeffect | * include * exclude |
| region | * global * california * japan * china * italy * turkey |

|  |  |
| --- | --- |
| **BSSA2014 Z10 SOF region** | |
| Z10 | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| region | * global * california * japan * china * italy * turkey |

|  |  |
| --- | --- |
| **ASK2014 Z10 SOF event Vs30type region** | |
| Z10 | Depth to 1.0 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| event | * mainshock * aftershock |
| Vs30type | * measured * inferred |
| region | * global * california * japan * china * italy * turkey |

|  |  |
| --- | --- |
| **AkkarBoomer2007 stiff SOF damping** | |
| media | * rock * stiff * soft |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| damping | Damping ratio of single degree of freedom oscillator, integer: 2, 5, 10, 20 or 30 |

|  |  |
| --- | --- |
| **AkkarBoomer2010 media SOF** | |
| Media | * rock * stiff * soft |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |
| --- |
| **Arroyo2010** |

|  |  |
| --- | --- |
| **Bindi2011 SOF component** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| component | * geoh * z |

|  |
| --- |
| **Kanno2006** |

|  |  |
| --- | --- |
| **Cauzzi2015 Vs30form SOF** | |
| Vs30form | Vs30 formulation   * 1 Vs30 from eq(5) * 2 Vs30 from eq(6) * 3 Vs30 from eq(7) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **DW12 SGSCLASS SOF** | |
| SGSCLASS | SGS Site class (Rodriguez-Marek et al. 2001)   * B * C * D |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **FG15 SOF forearc rtype** | |
| SOF | * interface * intraslab * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| arc | * forearc * backarc |
| rtype | Regression type   * linear * nonlinear |

|  |  |
| --- | --- |
| **TBA03 SGSCLASS SOF** | |
| SGSCLASS | SGS Site class (Rodriguez-Marek et al. 2001)   * B * C * D |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **BU17 SOF IMTYPE** | |
| SOF | * intraplate * subduction-interface * subduction-intraslab * subduction-unknown * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| IMTYPE | * CAV |
| * CAV5 |
| * CAVSTD |

|  |  |
| --- | --- |
| **CB10 Z25 SOF** | |
| Z25 | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

|  |  |
| --- | --- |
| **CB11 Z25 SOF Database** | |
| Z25 | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| Database | * CB08-NGA-PSV * CB08-NGA-NoPSV * PEER-NGA-PSV * PEER-NGA-NoPSV |

|  |  |
| --- | --- |
| **CB19 Z25 SOF region** | |
| Z25 | Depth to 2.5 km/sec shear-wave velocity horizon below site (km) |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |
| region | * global * california * japan * china * italy * turkey |

|  |  |
| --- | --- |
| **KM06 SOF** | |
| SOF | * strike-slip * normal * normal-oblique * reverse * reverse-oblique * unspecified |

**Spatial Correlation Methods**

|  |  |  |
| --- | --- | --- |
| **Syntaxis** | **Description** | **Value** |
| spa\_JB2009 param | isVs30 Clustered | * yes * no |
| spa\_LB2013 |  |  |
| spa\_SR2019 |  |  |
| spa\_Aldea2022 |  |  |

**IM Correlation Methods**

|  |  |  |
| --- | --- | --- |
| **Syntaxis** | **Description** | **Value** |
| corr\_BakerCornell2006 param | Component | * default * perpendicular |
| corr\_BakerJayaram2008 |  |  |
| corr\_JayaramBaker2011 param | Earthquake Mechanism | * crustal * interface * intraslab |
| corr\_Cimellaro2013 param | Component direction | * horizontal * vertical |
| corr\_Abrahamson2014 param | Type of residual | * within * between |
| corr\_BCHhydro2016 |  |  |
| corr\_BakerBradley2017 |  |  |
| corr\_JaimesCandia2019 |  |  |
| corr\_Candia2019 param | Earthquake mechanism | * interface * intraslab |
| corr\_GodaAtkinson2009 |  |  |
| corr\_Akkar2014 |  |  |
| corr\_Ji2017 |  |  |
| corr\_CambpelBozorgnia2019 |  |  |

**Option 7 - Spacial distributed data**

This option allows assigning properties to a site from a sourcefile (\*.mat), for instance a VS30 map or a seismic zonation map. This is an automated alternative to assigning each site the value of a property in Option 6. To enable this feature, set the property to NaN in Option 6.

**Example**: In the script below, VS30 for sites 1,2 and 6 are defined by the user directly in Option 6, whereas VS30 for sites 3,4 and 5 will be interpolated from the mat files in option 7.

Option 6 - Pre defined sites

Site1 -70.5635 -33.4124 691.3 VS30 760

Site2 -71.5635 -33.4124 691.3 VS30 760

Site3 -72.5635 -33.4124 691.3 VS30 NaN

Site4 -74.5635 -33.4124 691.3 VS30 NaN

Site5 -75.5635 -33.4124 691.3 VS30 NaN

Site6 -76.5635 -33.4124 691.3 VS30 1100

Option 7 - Spacial distributed data

layer VS30 CHI\_SIGAS.mat CHI\_USGS.mat 760

The mat files are used to represent spatially distributed data. Two syntaxes are supported. The matfile must be defined as a structured named spdata with the following fields:

spdata(1:N,1)=struct('lon',[],'lat',[],'value',[],'edge',[],'faces',[],'F',[]);>

**Constant value within a polygon:** In this case, all sites in the polygon with vertices <lon,lat> have the same value val.

lon: [N x 1]

lat: [N x 1]

value: val

edge: []

faces: []

**Variable property within a polygon**: Each site in the polygon <lon,lat> have values listed in <value>. The vector <edge> is the list of vertices located along the boundary, and <faces> is a delaunay triangularization of <lon,lat> and F is a scatteredInterpolant of <lon,lat>.

lon: [122120×1 double]

lat: [122120×1 double]

value: [122120×1 double]

edge: [2099×1 double]

faces: [242133×3 double]

F: [1×1 scatteredInterpolant]

HINT: compute faces and F using the following code

t = delaunay(lon,lat);

cg = [mean(lon(t),2),mean(lat(t),2)];

IN = inpolygon(cg(:,1),cg(:,2), lon(edge), lat(edge));

faces = t(IN,:);

F = scatteredInterpolant(lon, lat, value);

Chart

Description automatically generated with medium confidence