For elastic foundation FEA models, the accuracy of the SRSS approaches could be significantly degraded if a reduced number of incoherent modes is used. (Ghiocel, 2013b, 2014a). It should be noted that the SRSS approach requires a separate SSI analysis for each incoherent mode that could make it highly impractical for application to complex SSI models with elastic basemats under high-frequency inputs.

It should be also noted that for the stochastic simulation approach and the deterministic approach based on linear superposition, the default number of extracted coherency matrix eigenvectors or incoherent spatial modes is all modes. The use of all modes has only a negligible impact on the incoherent SSI analysis runtime. Consideration of all incoherent spatial modes improves the incoherent SSI accuracy and produces an “exact” recovery of the free-field coherency matrix at the interaction nodes; this can be checked for each calculation frequency. The SRSS approach is more difficult to apply since has no convergence criteria for the required number of incoherent spatial modes to be considered. For more details on the incoherent SSI approaches, please see the ACS SASSI MAIN manual and its references (Tseng and Lilhanand, 1997, Short et al., 2007, Ghiocel, 2007a, Ghiocel et al. 2009a, 2009b, 2010b and 2010c, Ghiocel, 2013b).

WARNING: *Before using the SRSS approach, a preliminary investigation to establish the required number of incoherent modes is recommended. The HOUSE output shows the cumulative modal mass/variance contributions at all SSI frequencies – search for the string “I N C O”. in the HOUSE output. For a limited number of incoherent modes, the cumulative mode contributions could be much less than 100%. We suggest to consider a number of incoherent modes that satisfies the 90% mode contribution criterion, similar to the cumulative modal mass criterion used in structural dynamics.*

Use Multiple Excitations

Select this button for activating the multiple excitation or the nonuniform input option. To use this option the wave passage option should be also selected. This option is applicable to a single continuous foundation or multiple foundations. The nonuniform amplitude seismic input is introduced by a variable motion Fourier amplitude in the free-field at different locations under foundation. The multiple excitation or nonuniform input motion option could be applied in conjunction with motion incoherency and wave passage for creating a more realistic, randomly spatially varying seismic ground motion environment.

WARNING: *For the nonuniform input case with a single foundation, for the baseline code the foundation could be partitioned in up to 200 zones, while for the fast-solver can be partitioned in 2,000 zones, each zone having a slightly different amplitude input. Please note that the node numbering for each foundation should be in a continuous sequence.*

Input Motion Number

Select the number of the active input motions that is equal to the number of isolated

