

PRESENTED BY:
McKENNA ROBERTS
WEDNESDAY, MAY 5, 2010
1:15PM-2:15PM ENG 239

Title:
**Evaluation of parameter effects in
estimating non-linear uncertainty
propagation**

THE PROPAGATION OF UNCERTAINTY IN NON-LINEAR CASES CAN BE HANDLED ACCURATELY AND EASILY WITH A PIECEWISE LINEAR APPROACH TO PROPAGATING THE PROBABILITY DENSITY FUNCTION THROUGH THE ANALYSIS EQUATION. PREVIOUS WORK OUTLINED THIS METHOD BUT DID NOT EXAMINE THE EFFECTS OF PARAMETERS ON THE ACCURACY OF THE RESULTS. PARAMETERS TO BE CHOSEN IN THIS APPROACH INCLUDE THE NUMBER OF EVALUATION POINTS AND THE DISTRIBUTION OF THOSE POINTS OVER THE RANGE OF INTEREST. THE EFFECTS OF THESE PARAMETERS ARE EXPLORED FOR THREE ELEMENTARY FUNCTIONS. IT IS FOUND THAT FOR THE FUNCTIONS EXAMINED, THE PIECEWISE LINEAR APPROACH ALWAYS CONVERGED WITH INCREASING NUMBERS OF POINTS. FOR THE CASES EXAMINED, 30-200 EVALUATION POINTS WERE REQUIRED FOR CONVERGENCE. A UNIFORM DISTRIBUTION OF POINTS WAS BOTH THE SIMPLEST TO IMPLEMENT AND CONVERGED THE FASTEST.