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Abstract Problems under uncertainty conditions appear frequently in practice. The use of classical interval analysis constitutes an interesting tool for the study of such problems with the uncertain variables assumed to be interval variables. Ben-Haim's info-gap (or information-gap) decision theory (IGDT) constitutes an interesting method for the study of such problems. The determination of the maximum value of the uncertainty parameter (or horizon of uncertainty) for the uncertain variables so that the performance requirement(s) is (are) satisfied is of primary importance in the IGDT. On the other hand, the method of quantifier elimination in computer algebra permits the transformation of quantified formulae to equivalent formulae, but free from the quantified variables. Here the method of quantifier elimination is applied to the mixed case with two or three uncertain variables where one (or two) of these variables is (are) ordinary interval variable(s) whereas the remaining uncertain variable(s) satisfies (satisfy) the popular fractional-error model of uncertainty in the IGDT. Therefore, here the horizon of uncertainty concerns only the latter variable(s). The present method is illustrated in the following five simple applications: (i) the problem of the area of a rectangle , (ii) the problem of the volume of a rectangular cuboid, (iii) the problem of the buckling load of a fixed-free column, (iv) the problem of the equivalent spring constants of two elastic springs connected in series and in parallel and (v) the similar problem for the resistances of three resistors.

Keywords Uncertainty; Info-gap; Information-gap; Ben-Haim's IGDT; Fractional-error model;Interval variables; Uncertainty parameter; Horizon of uncertainty· Rectangle; Rectangular cuboid;Areas; Volumes; Columns; Buckling loads; Springs; Equivalent spring constants; Resistors;Equivalent resistances; Quantified formulae; Quantifier elimination; Quantifier-free formulae

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