Case: Steel Plate b = 800 x 2000 mm subject to 450 kN uniformly distributed in 9 nodes.

t = 15 mm

E= 1999948,02 MPa (according to RSA)

ν = 0,3

σ_y = 248,21 MPa (according to RSA)

Manual Calculation:

$\sigma_c = k\frac{\pi^2 E}{12(1-\vartheta^2)(\frac{b}{t})^2}$ = 254 N/mm^2 where k = 4 for edges simply supported

Ultimate Load $P_{ult} = b\ t\ \sqrt{\sigma_c \sigma_y}\ (1 - 0{,}22\sqrt{\frac{\sigma_c}{\sigma_y}})$ = 3049 kN

RSA Calculation:

Critical Coefficient according RSA = 3,93 Mode 1 or Mode 2 and 1,28 Mode 3

Buckling load = 450 x 3,93 = 1768 kN (Modes 1 and 2)

Buckling load = 450 x 1,28 = 576 kN (Mode 3)

Question: How should the RSA results should be interpreted?