Normalized energy release rate $\frac{G_{(\cdot\cdot)}}{G_0}$ as function of crack angular semi-aperture $\Delta\theta$, calculated with in-house VCCT and Abaqus built-in J-Integral (*CONTOUR INTEGRAL) post-processing routines $\frac{G_I}{G_0}$, FEM-VCCT 0.7 $\frac{G_{II}}{G_0}$, FEM-VCCT $G_{I}^{+}G_{II}$, FEM-VCCT $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 2 0.65Grown, FEM-JINT, Contour 3 $\xrightarrow{G_{TOT}}$, FEM-JINT, Contour 4 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 6 0.60.55 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 11 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 12 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 13 0.5GTOT, FEM-JINT, Contour 14 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 15 0.45 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 19 $\frac{G_{TOT}}{G_0}$, FEM-JINT, Contour 20 - $\frac{G_I}{G_0}$, BEM 0.4 $\frac{G_{II}}{G_0}$, BEM $G_{I}^{G_{0}}$, BEM 0.350.30.250.20.150.1 $5\cdot 10^{-2}$ 10 20 30 40 50 60 70 80 100 110 120 130 140 180 90 150 160 170 $\Delta\theta\,[^\circ]$