

Cross-sectional Views of $90^{\circ}/90^{\circ}$ Pipe Without/With a Weld

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9-20-2012

Outlines

- Define the Locations of the Profiles
- Pipe without A Weld ($\#Grid = 0.8 \times 10^6$)
 - Display in Tecplot: Figs.(a)
 - Display in FLUENT: Figs.(b)
- Contours of Turbulence Intensity in Tecplot
 - Pipe with A Weld ($\#Grid = 1.18 \times 10^6$): Figs.(c)
 - Pipe with A Weld ($\#Grid = 5 \times 10^6$): Figs.(d)
- Contours of Turbulence Intensity in Tecplot
 - Pipe without A Weld ($\#Grid = 0.8 \times 10^6$): Figs.(a)
 - Pipe with A Weld ($\#Grid = 5 \times 10^6$): Figs.(d)

Define the Locations of the Profiles

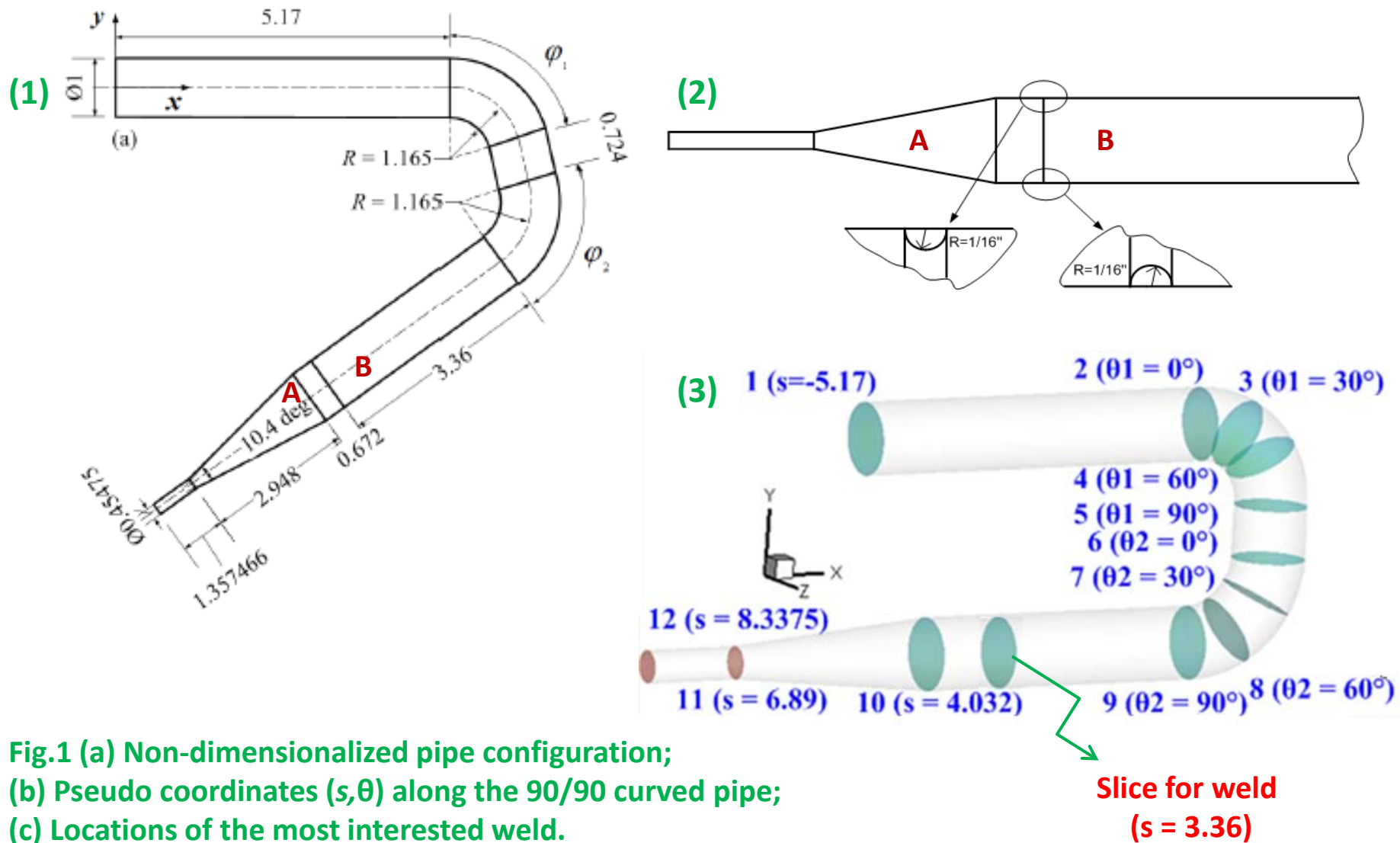
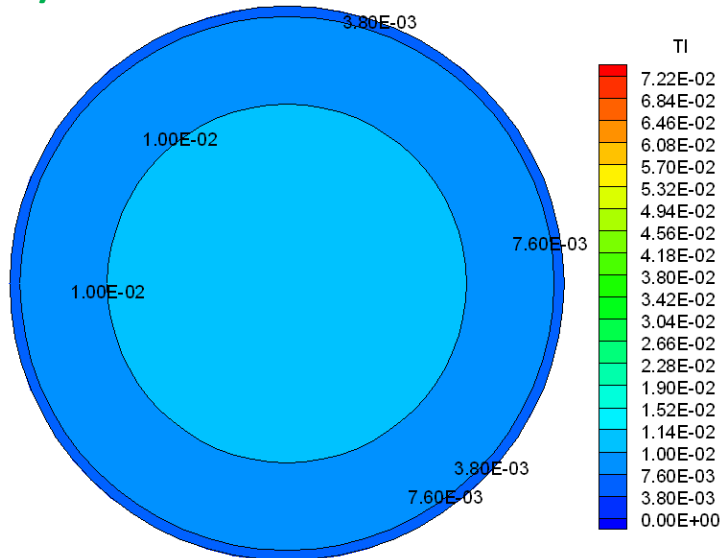


Fig.1 (a) Non-dimensionalized pipe configuration;
 (b) Pseudo coordinates (s, θ) along the 90/90 curved pipe;
 (c) Locations of the most interested weld.

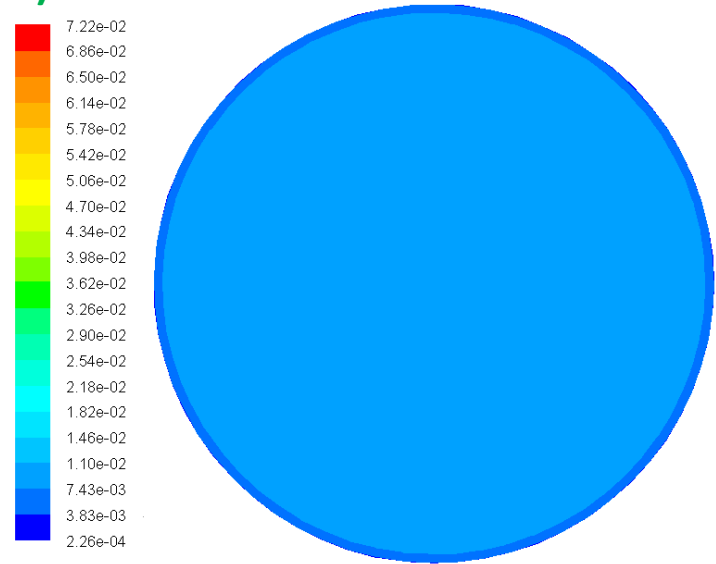
Contour of Turbulence Intensity

— Pipe Without A Weld

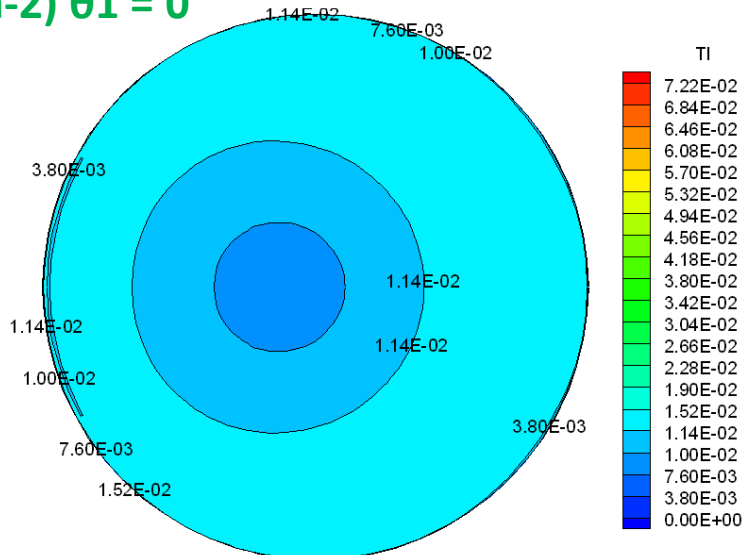
(a-1) $s = -5.17$



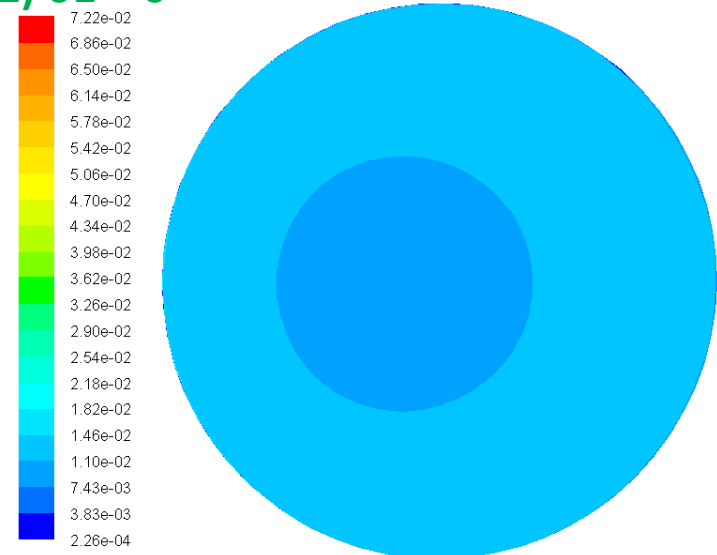
(b-1) $s = -5.17$



(a-2) $\theta_1 = 0$

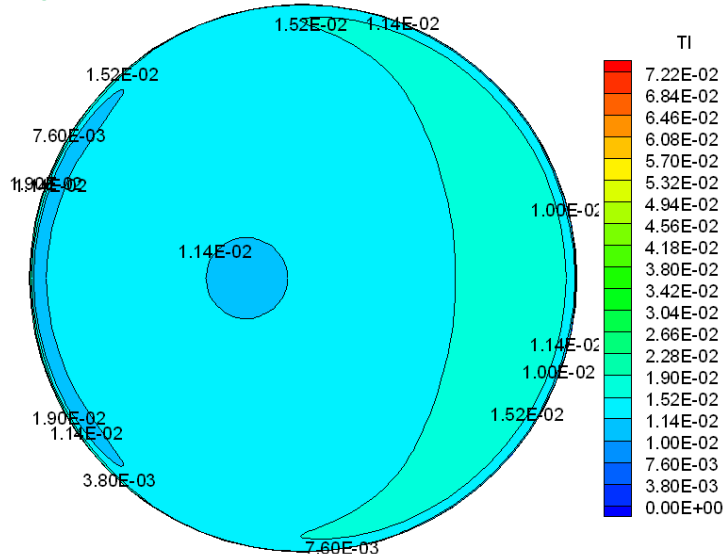


(b-2) $\theta_1 = 0$

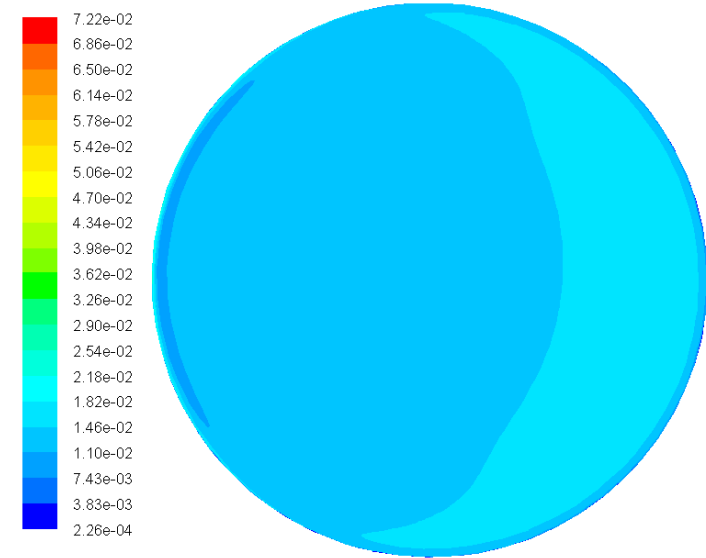


Contour of Turbulence Intensity — Pipe Without A Weld

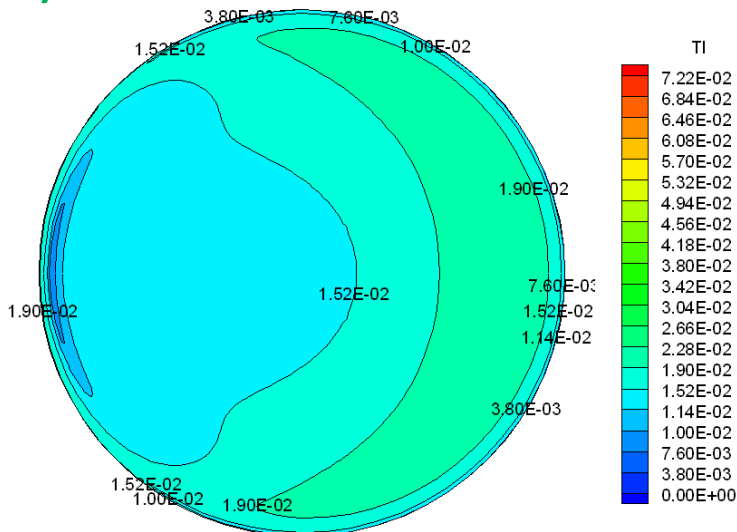
(a-3) $\theta_1 = 30$



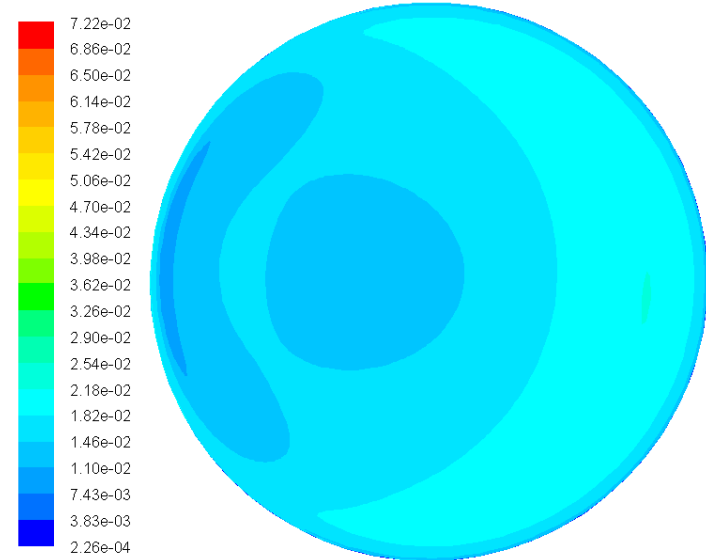
(b-3) $\theta_1 = 30$



(a-4) $\theta_1 = 60$

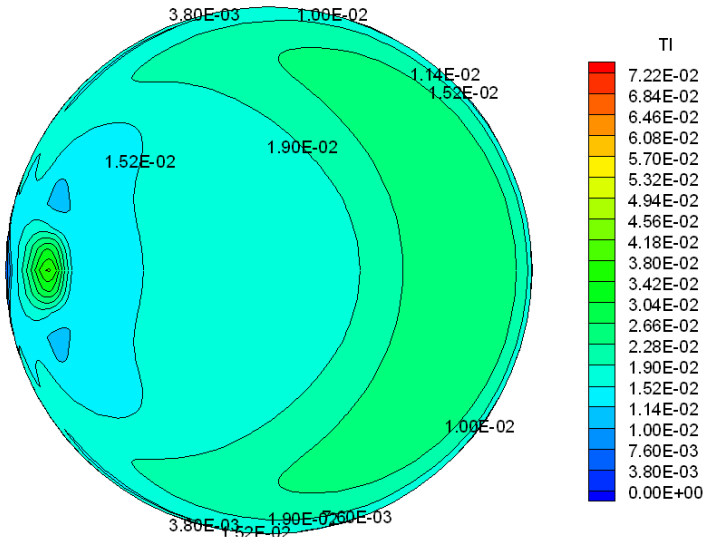


(b-4) $\theta_1 = 60$

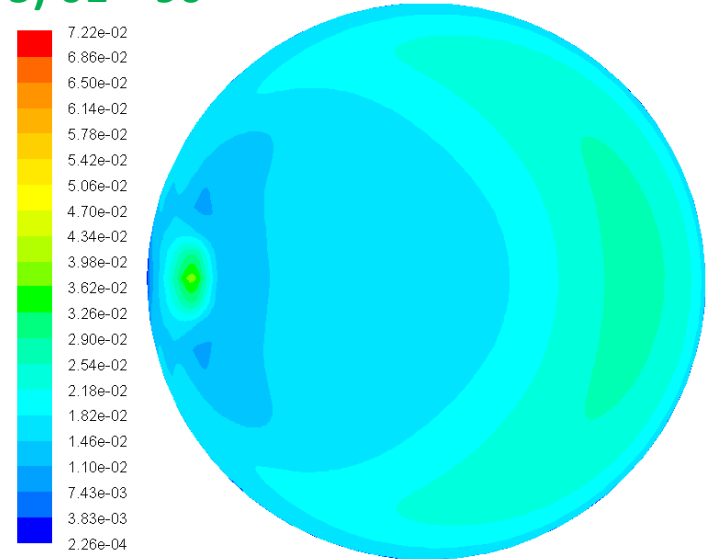


Contour of Turbulence Intensity — Pipe Without A Weld

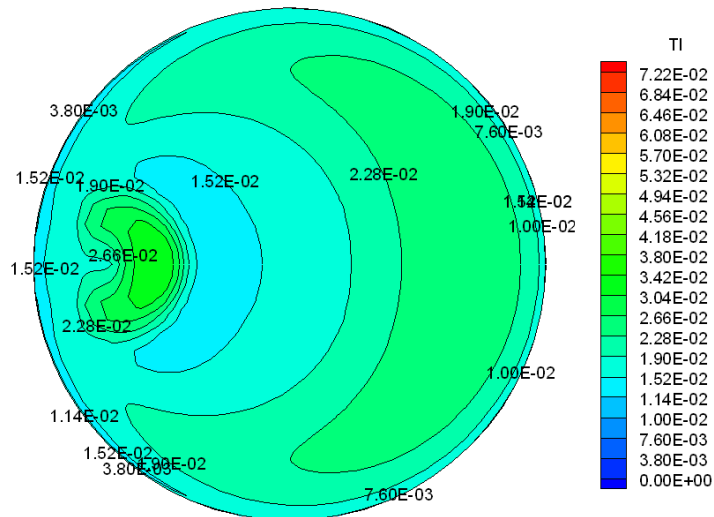
(a-5) $\theta_1 = 90$



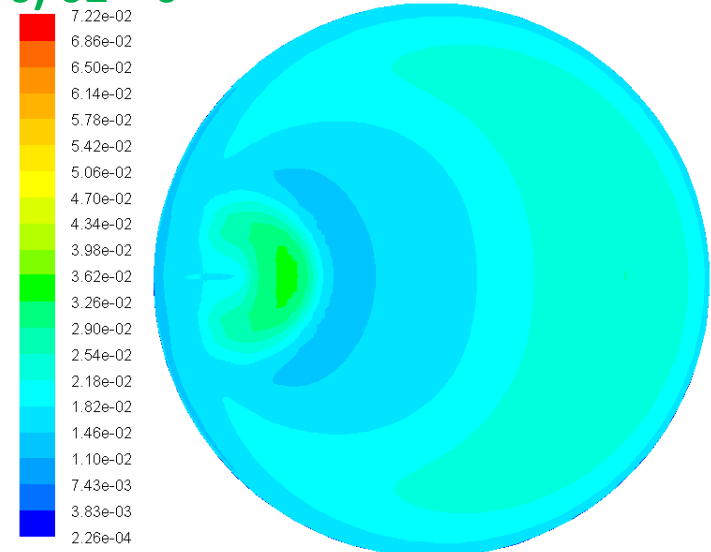
(b-5) $\theta_1 = 90$



(a-6) $\theta_2 = 0$

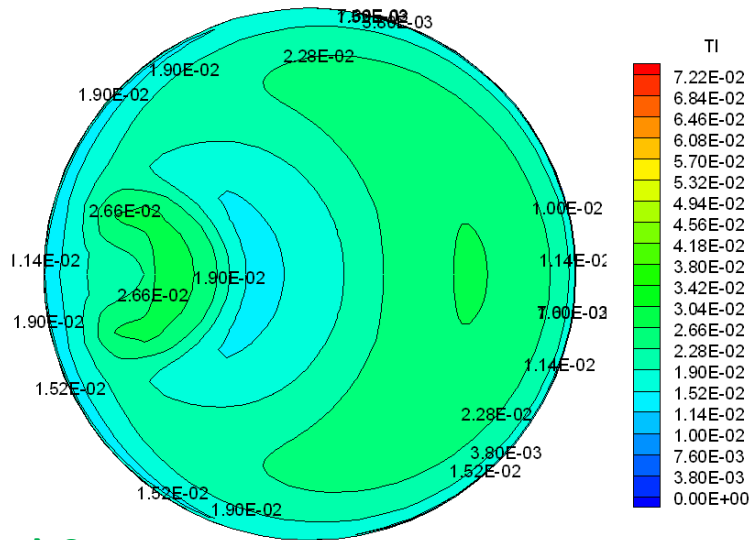


(b-6) $\theta_2 = 0$

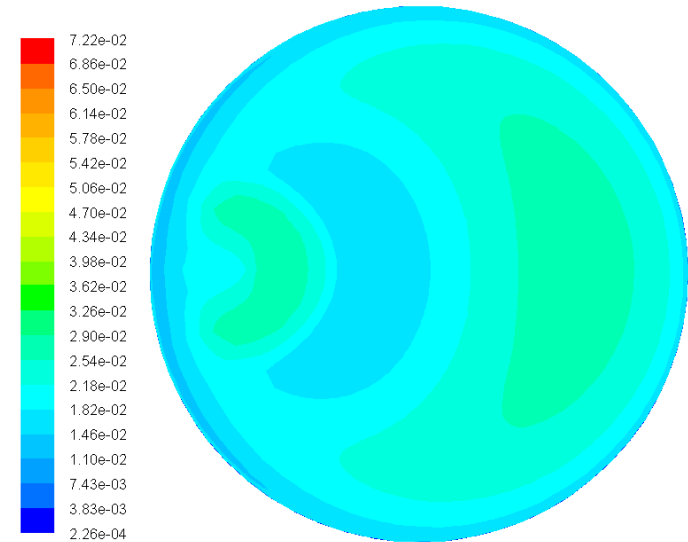


Contour of Turbulence Intensity — Pipe Without A Weld

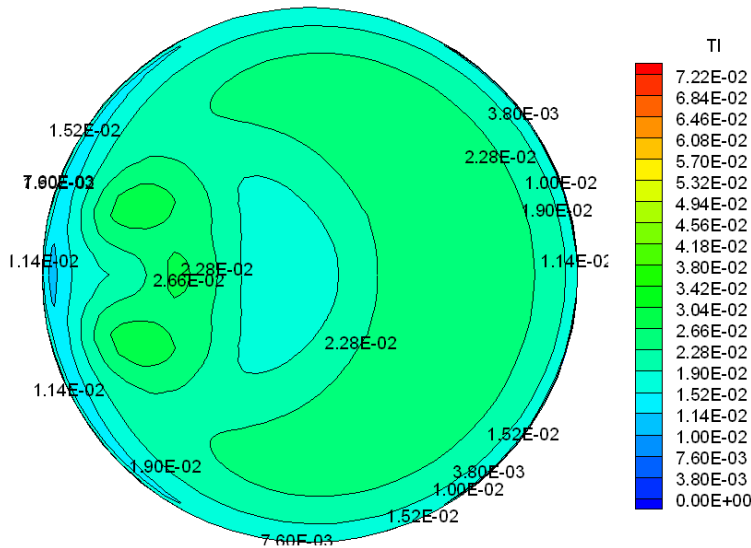
(a-7) $\theta_2 = 30$



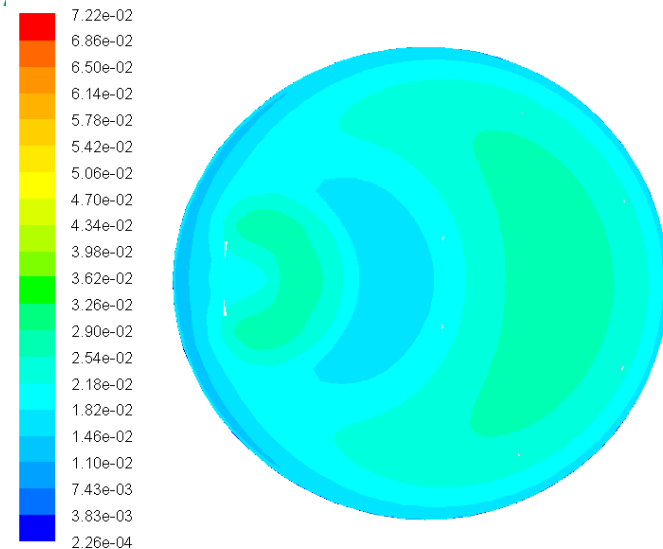
(b-7) $\theta_2 = 30$



(a-8) $\theta_2 = 60$



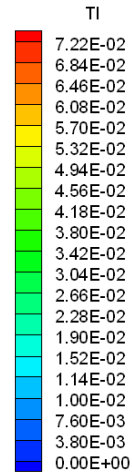
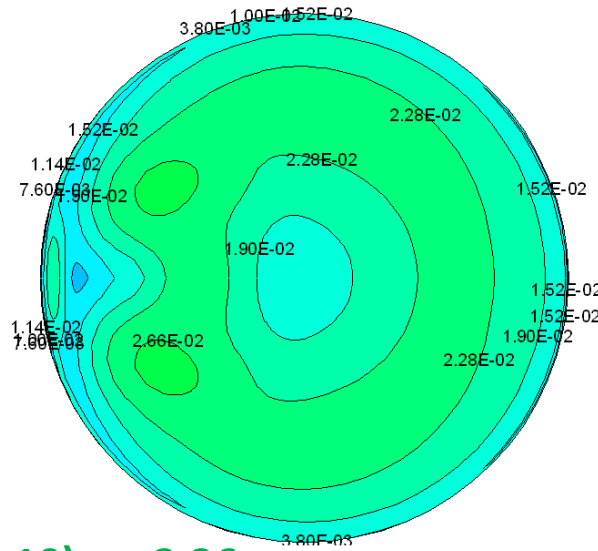
(b-8) $\theta_2 = 60$



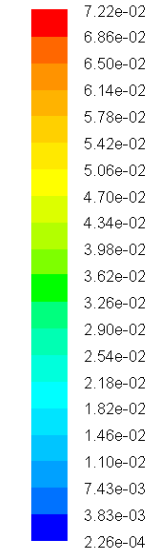
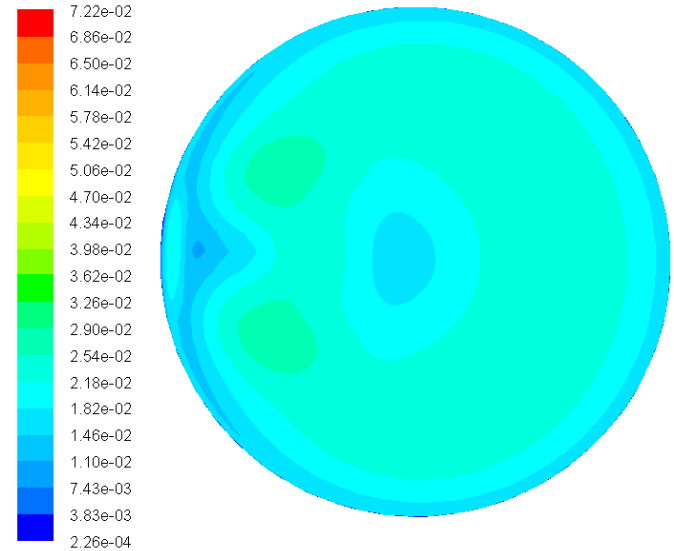
Contour of Turbulence Intensity

— Pipe Without A Weld

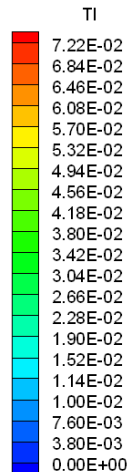
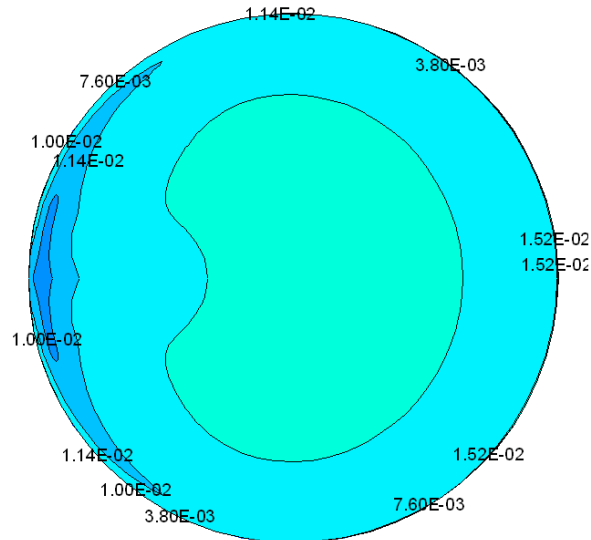
(a-9) $\theta_2 = 90$



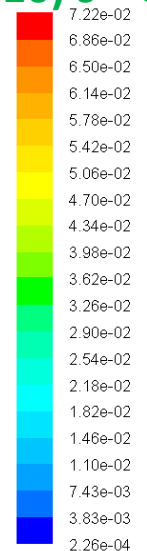
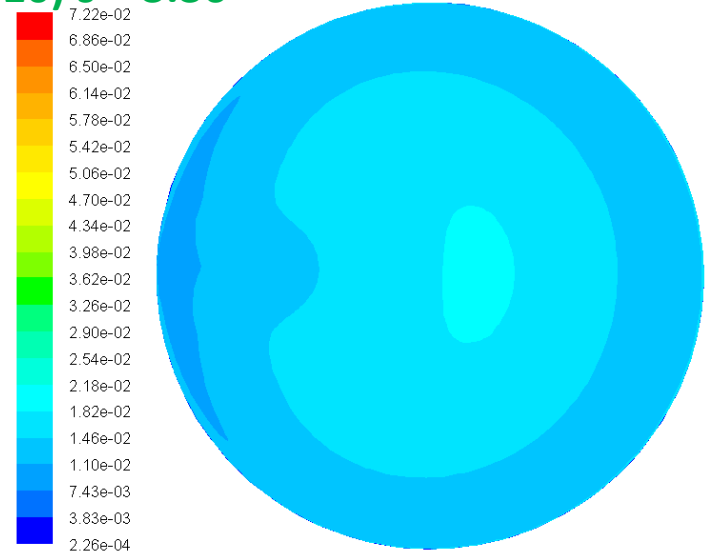
(b-9) $\theta_2 = 90$



(a-10) $s = 3.36$

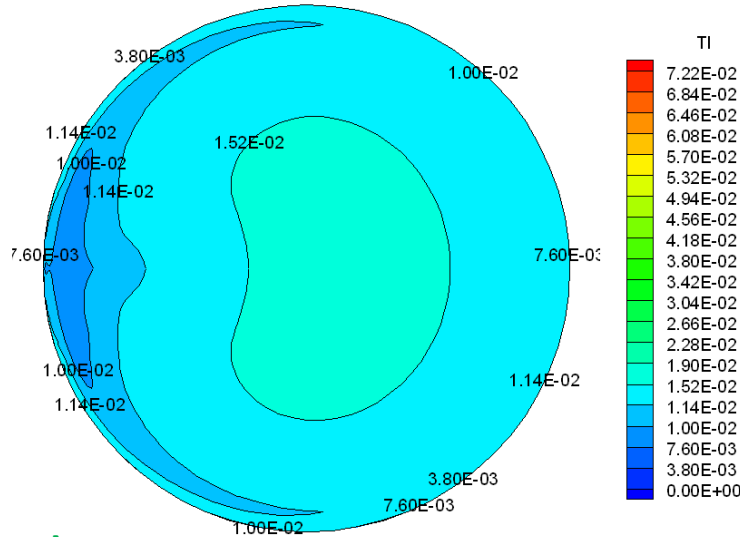


(b-10) $s = 3.36$

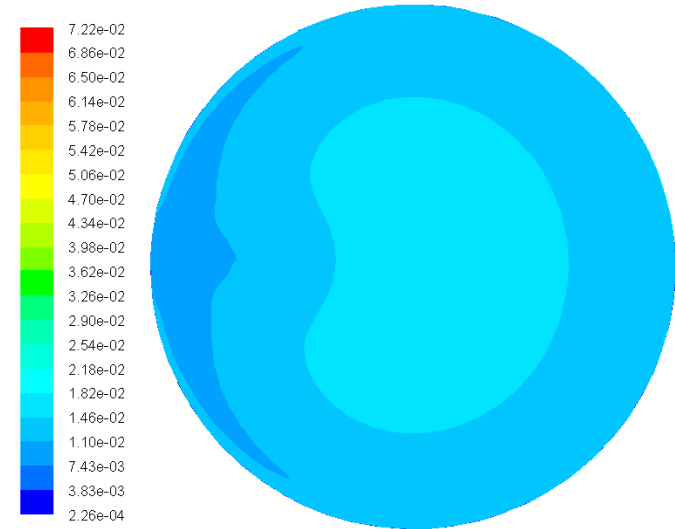


Contour of Turbulence Intensity — Pipe Without A Weld

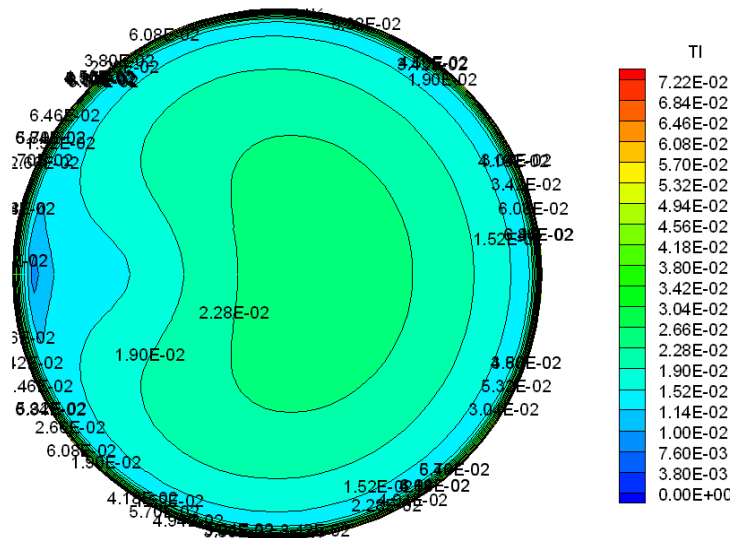
(a-11) $s=4.032$



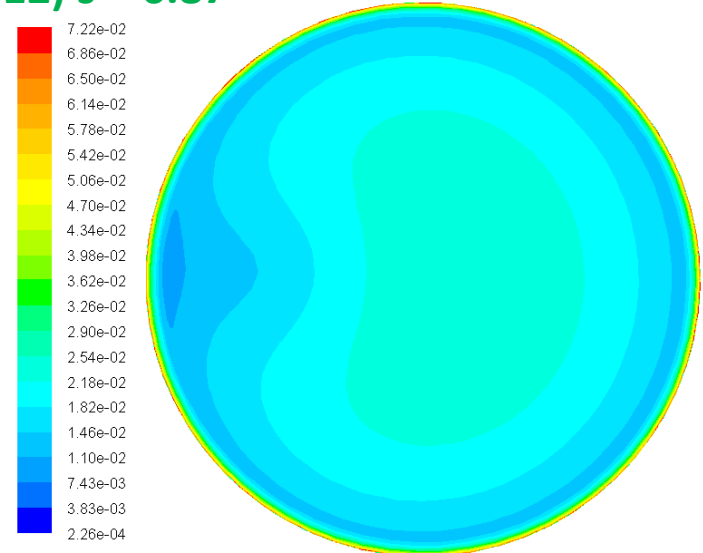
(b-11) $s = 4.032$



(a-12) $s= 6.87$

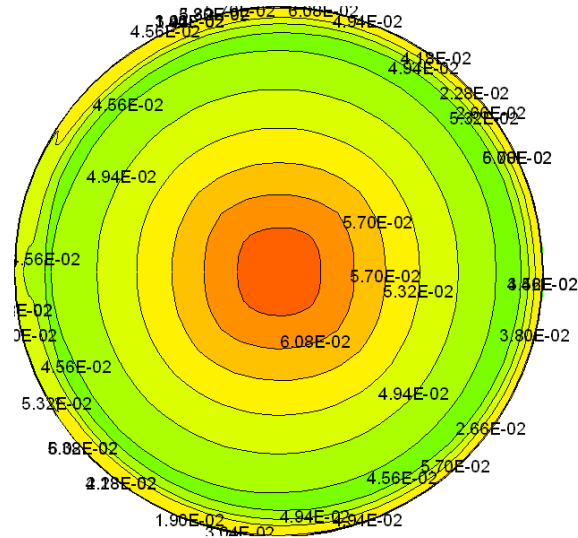


(b-12) $s = 6.87$

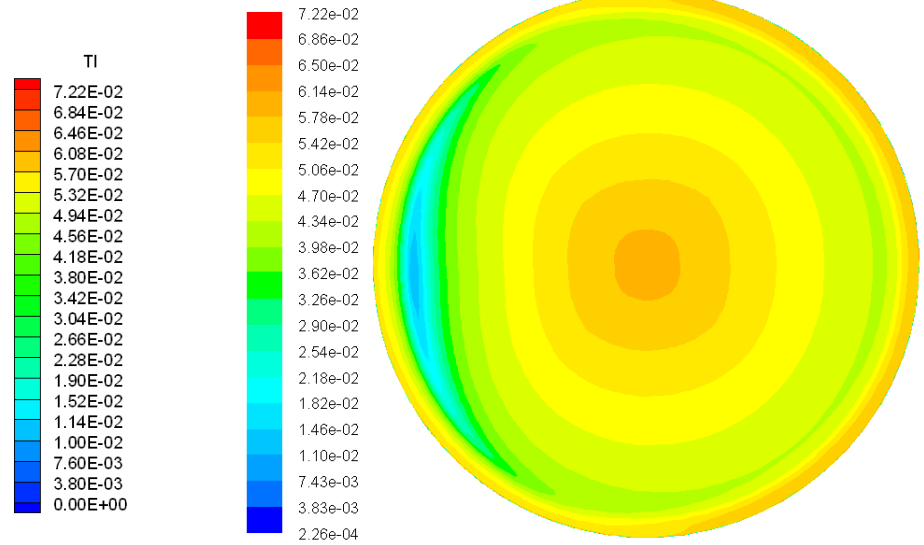


Contour of Turbulence Intensity — Pipe Without A Weld

(a-13) $s = 8.3375$

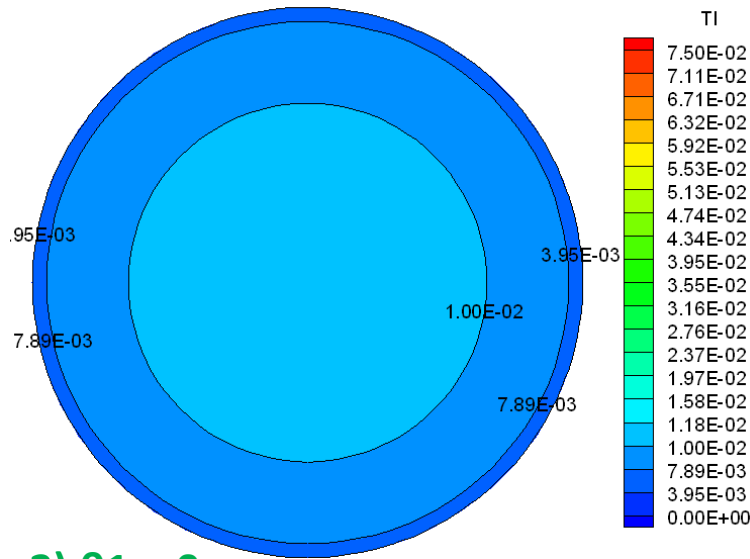


(b-13) $s = 8.3375$

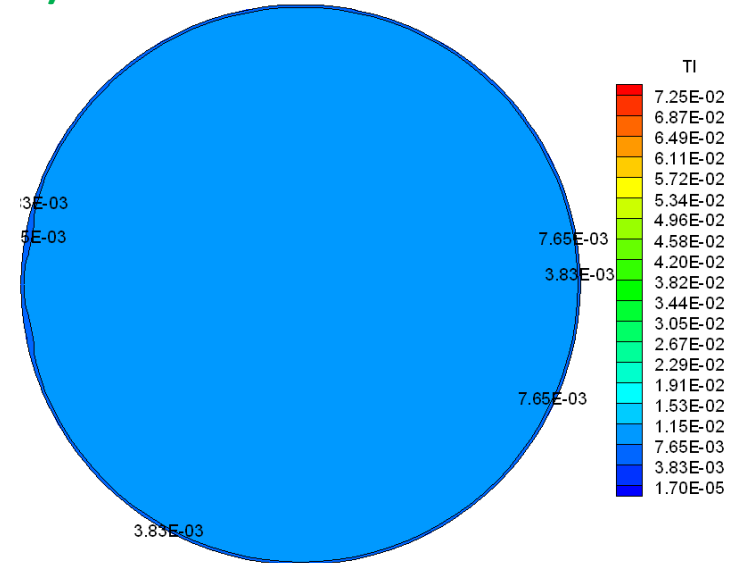


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

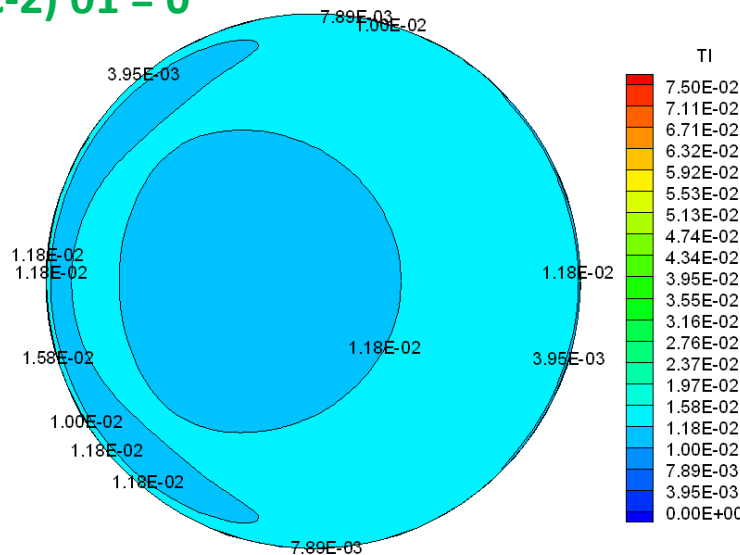
(c-1) $s = -5.17$



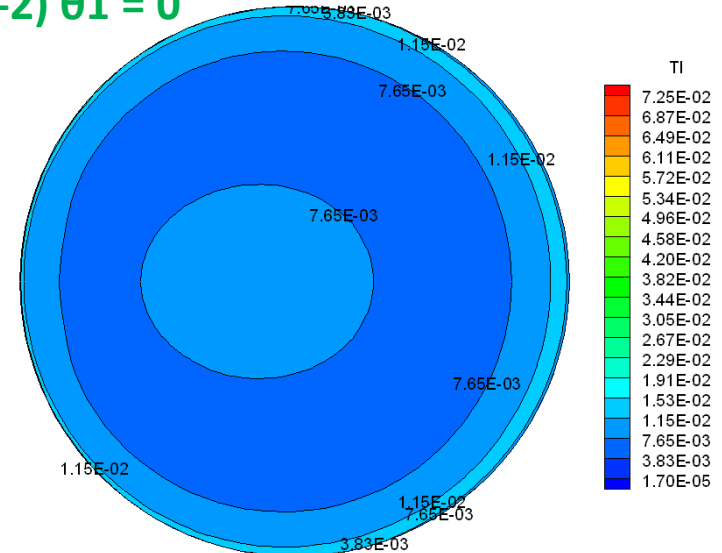
(d-1) $s = -5.17$



(c-2) $\theta_1 = 0$

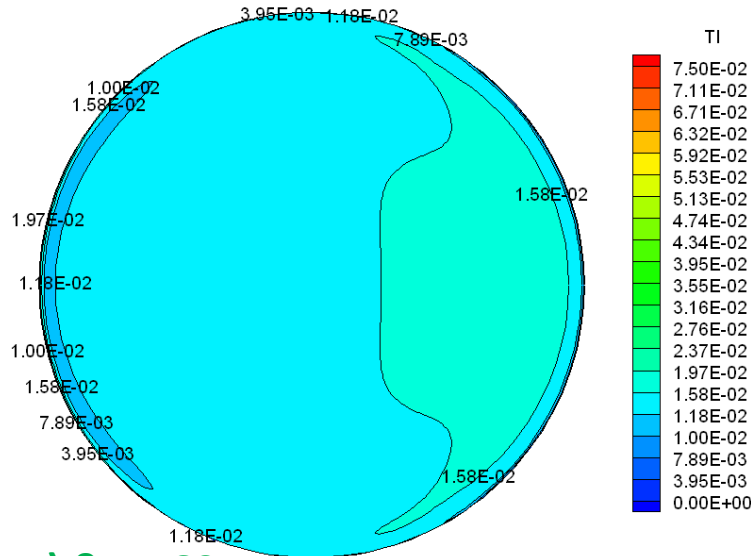


(d-2) $\theta_1 = 0$

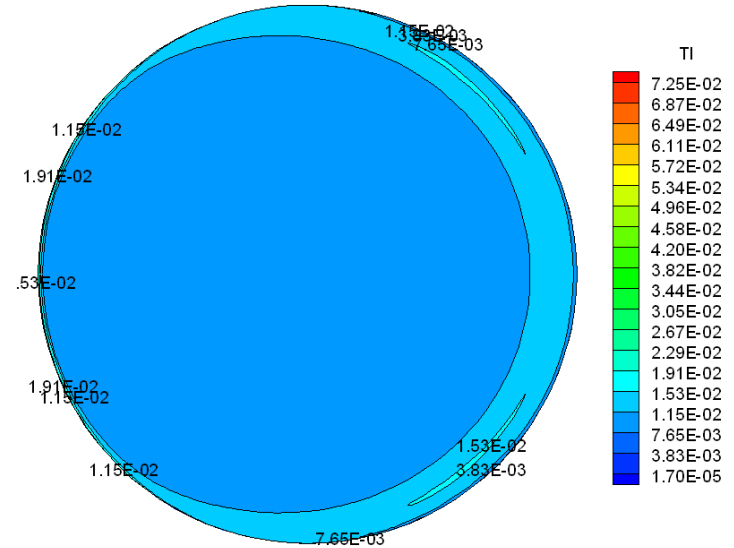


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

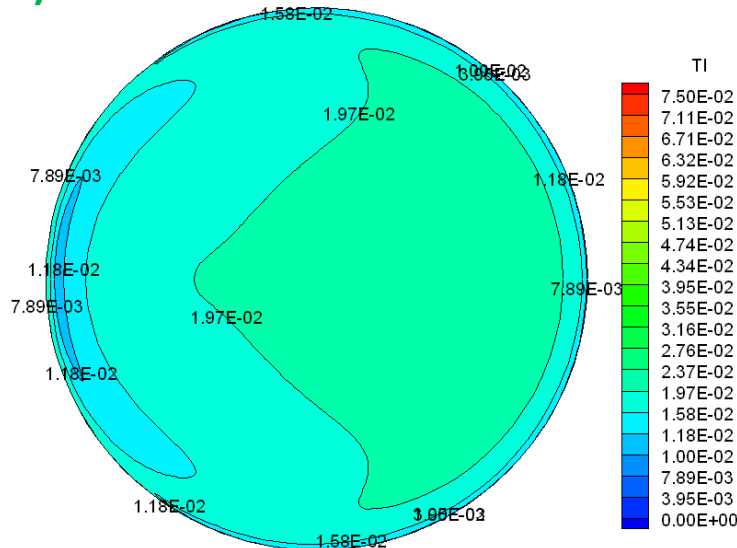
(c-3) $\theta_1 = 30$



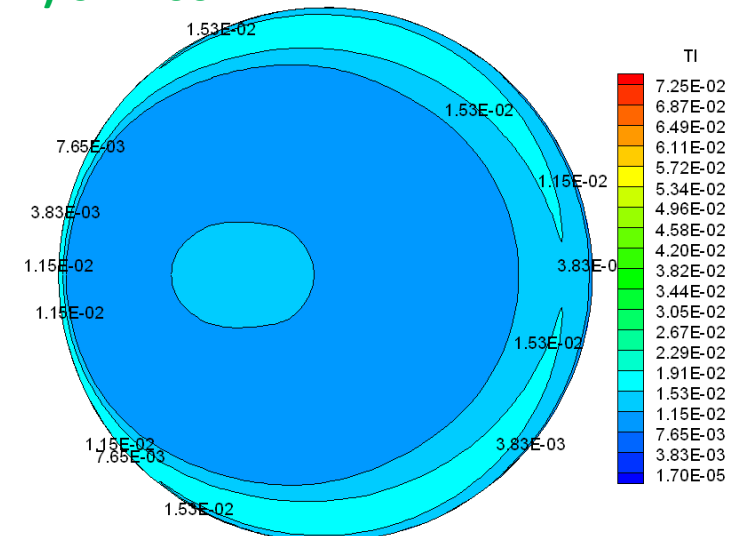
(d-3) $\theta_1 = 30$



(c-4) $\theta_1 = 60$

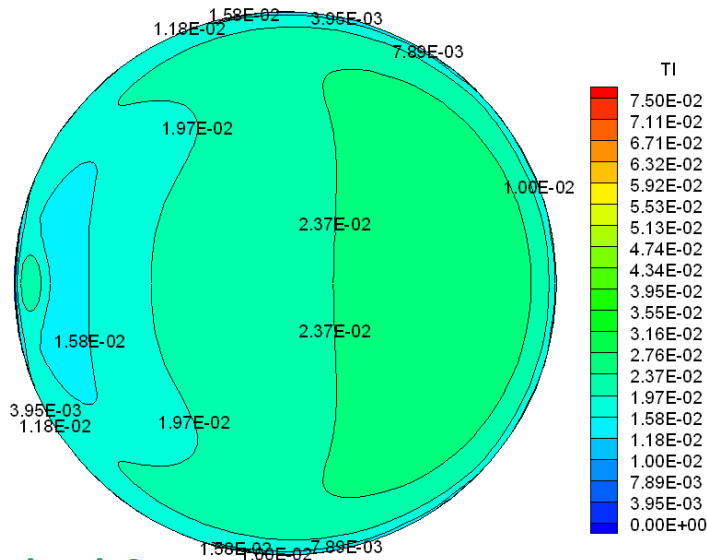


(d-4) $\theta_1 = 60$

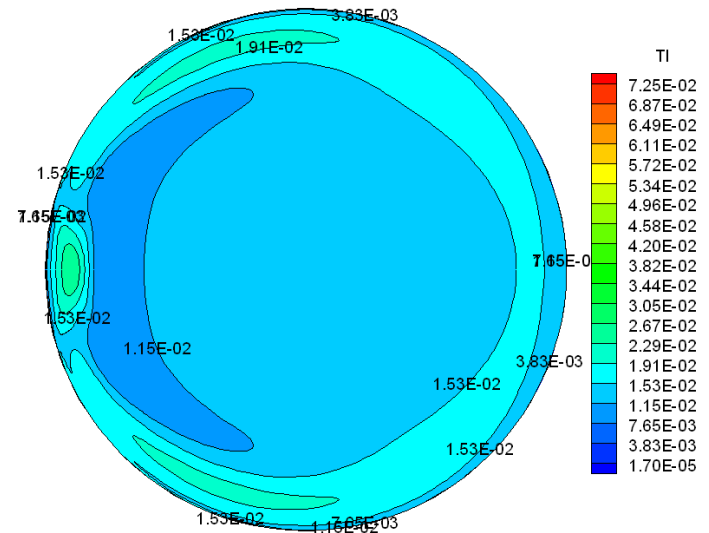


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

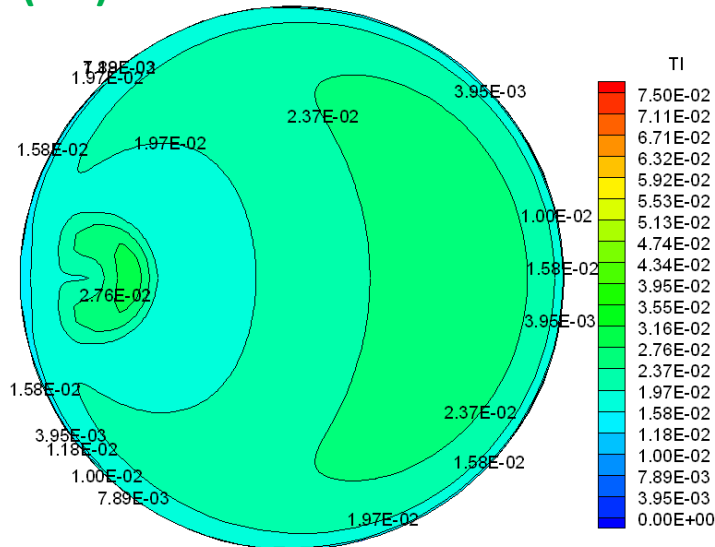
(c-5) $\theta_1 = 90$



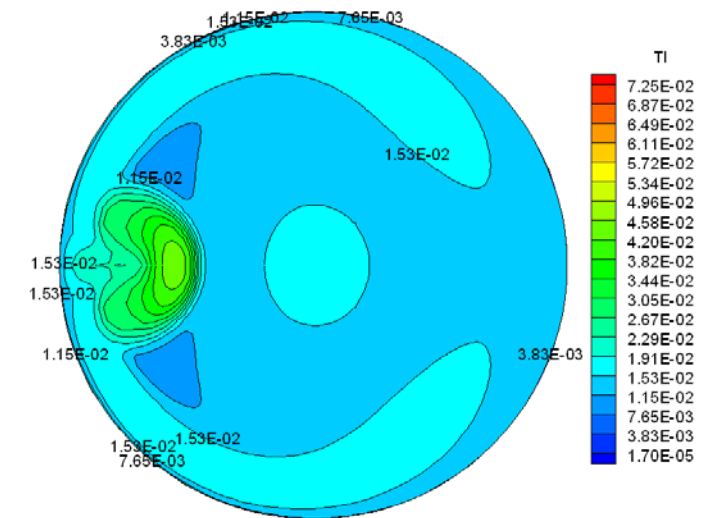
(d-5) $\theta_1 = 90$



(c-6) $\theta_2 = 0$



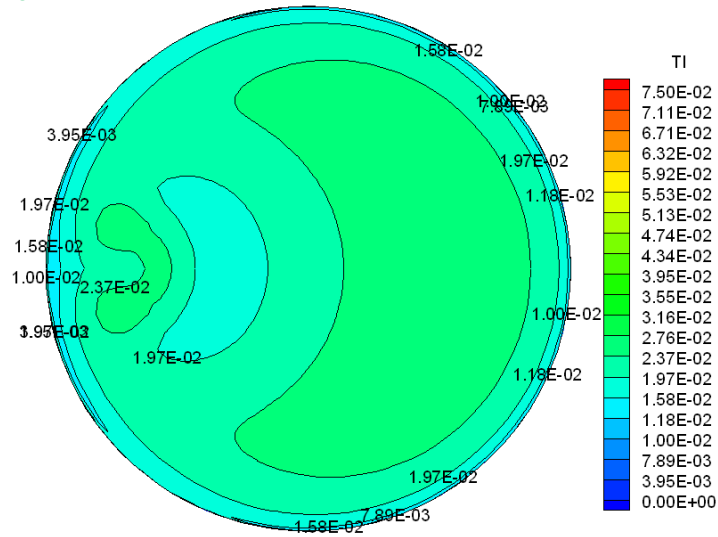
(d-6) $\theta_2 = 0$



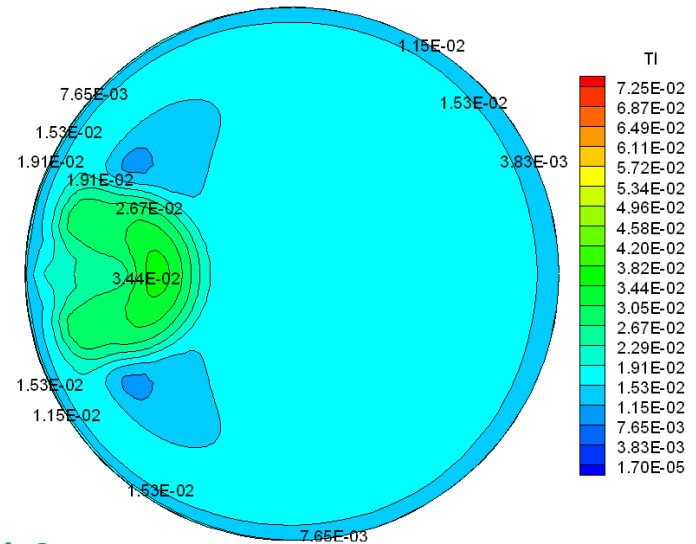
Contour of Turbulence Intensity in Tecplot

— Pipe With A Weld

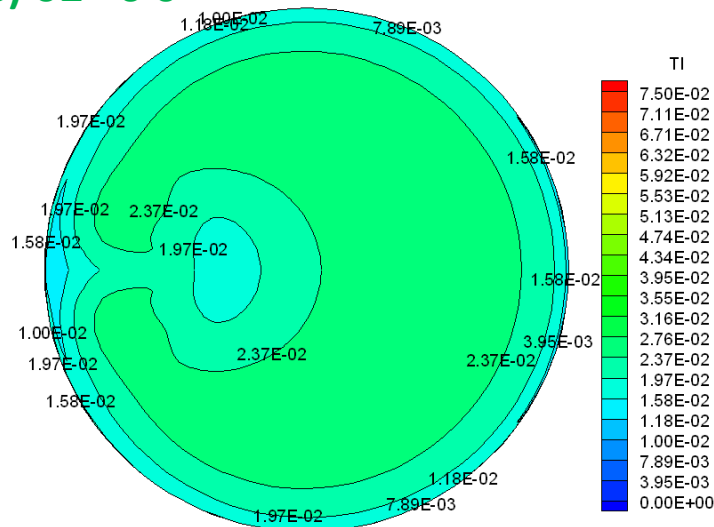
(c-7) $\theta_2 = 30$



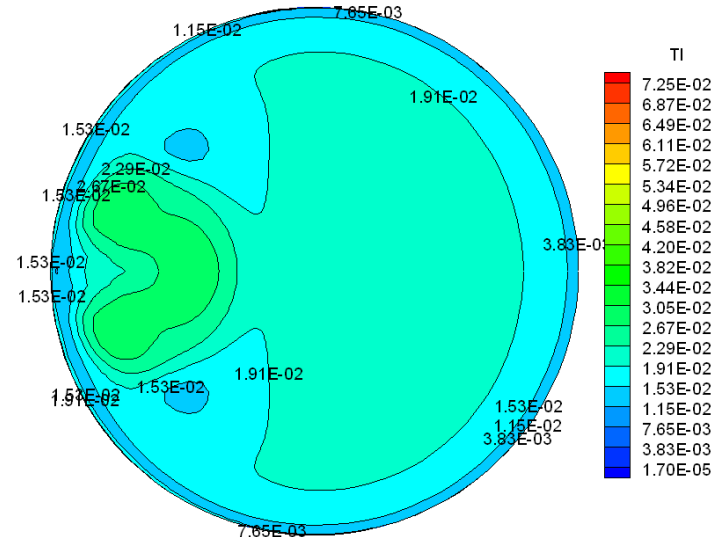
(d-7) $\theta_2 = 30$



(c-8) $\theta_2 = 60$

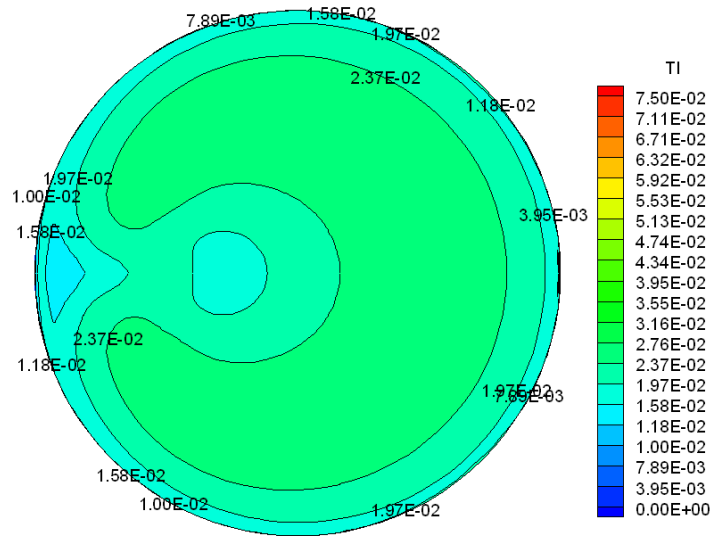


(d-8) $\theta_2 = 60$

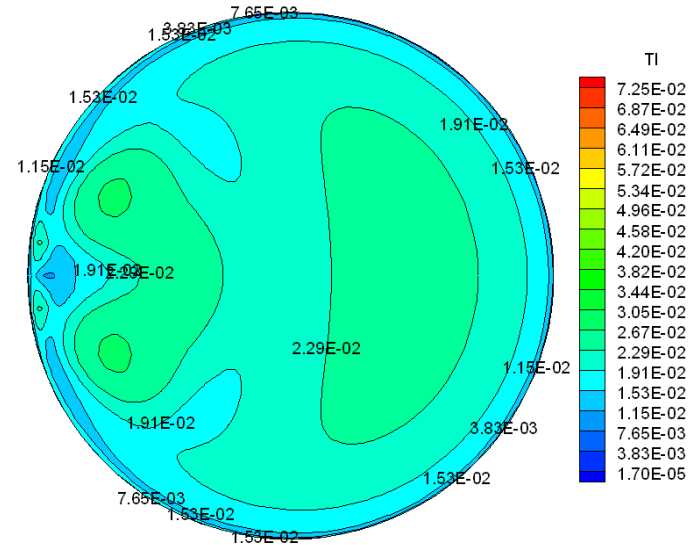


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

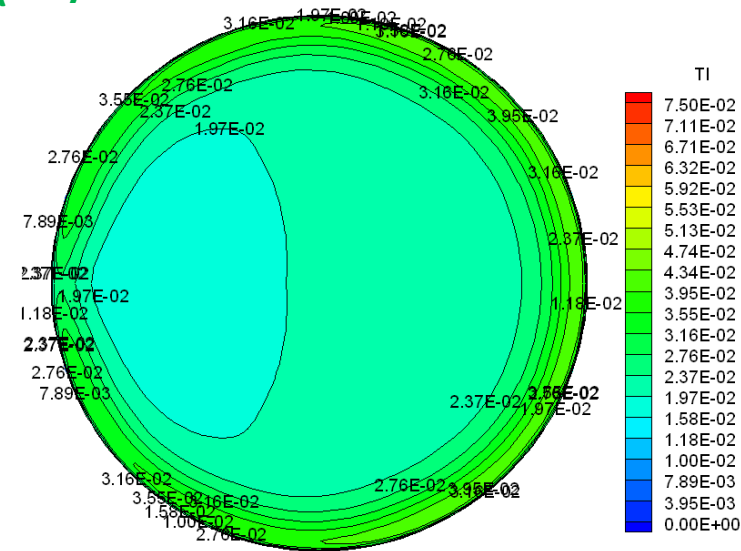
(c-9) $\theta_2 = 90$



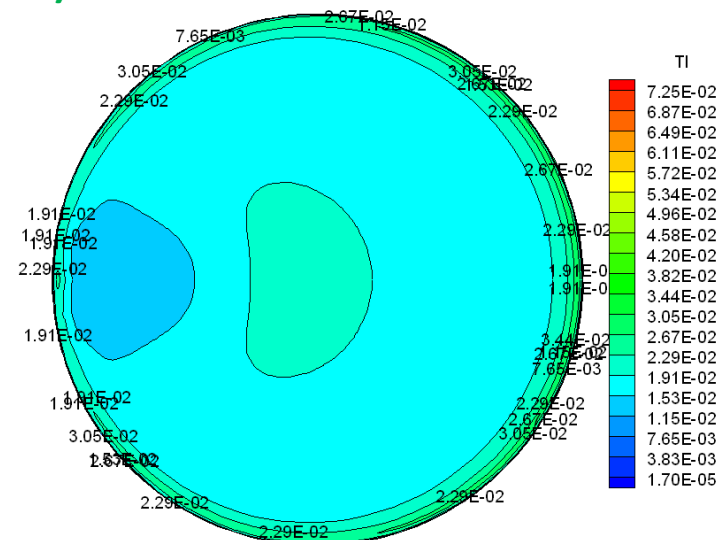
(d-9) $\theta_2 = 90$



(c-9) $s = 3.36$

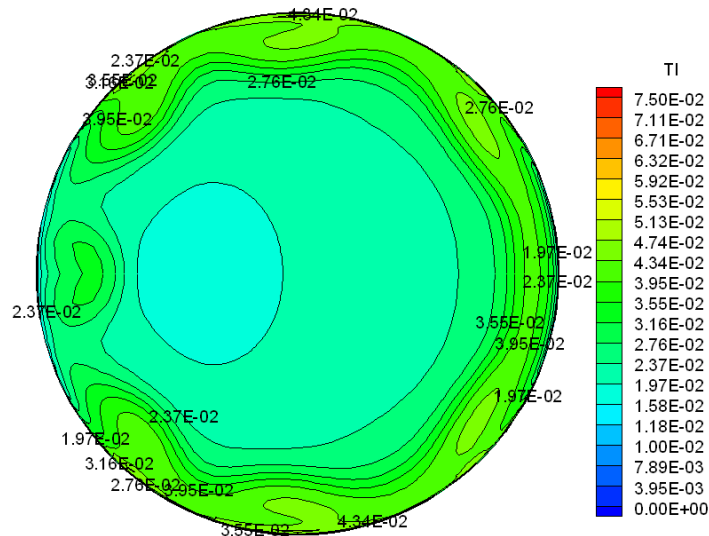


(d-10) $s = 3.36$

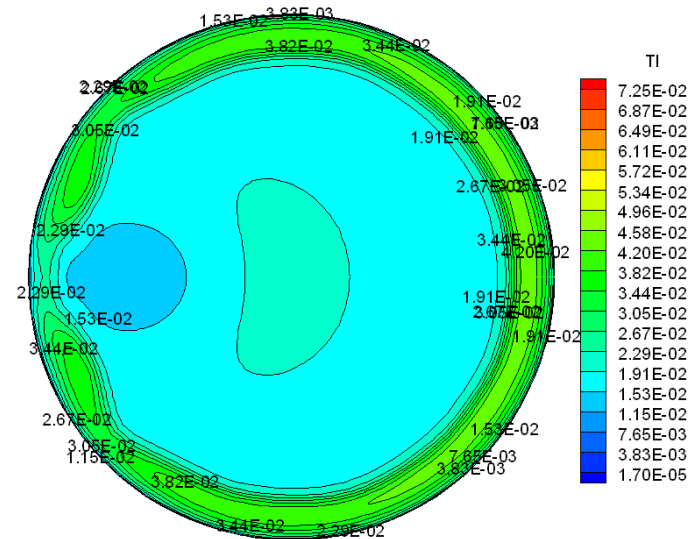


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

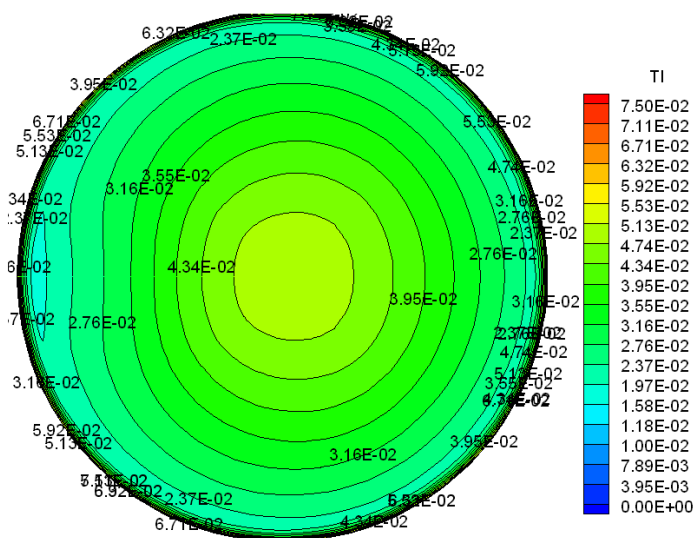
(c-11) $s = 4.032$



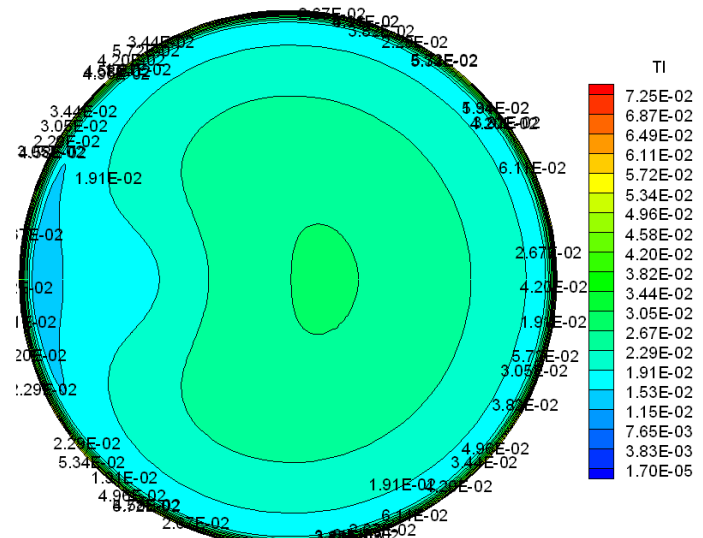
(d-11) $s = 4.032$



(c-12) $s = 6.87$

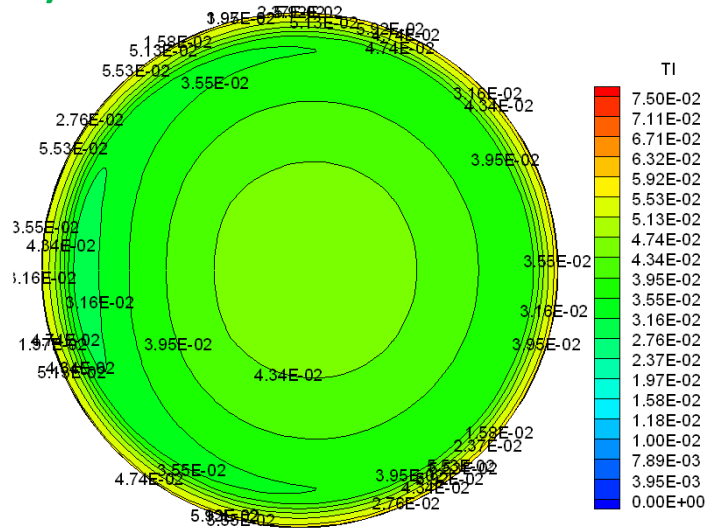


(d-12) $s = 6.87$

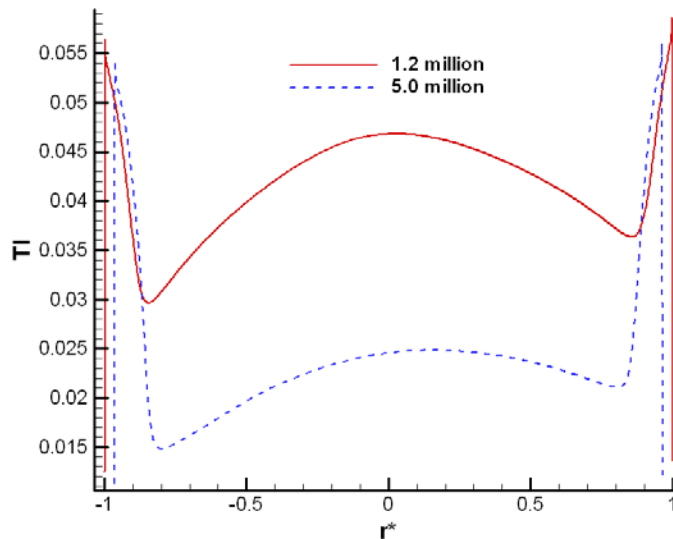
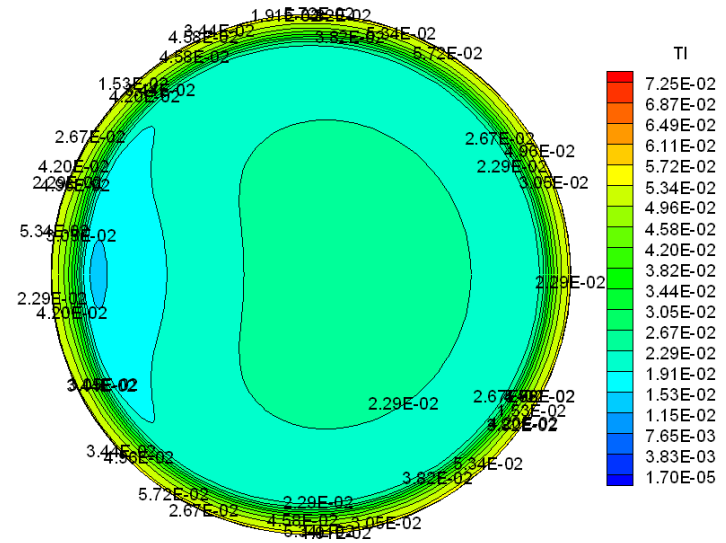


Contour of Turbulence Intensity in Tecplot — Pipe With A Weld

(c-13) $s = 8.3375$



(d-13) $s = 8.3375$

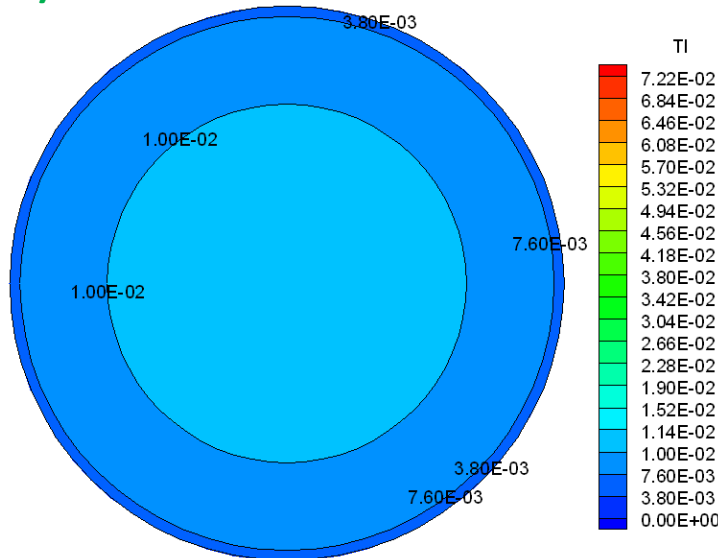


**Fig.2 Turbulence intensity line plot
along the centerline at the pipe exit**

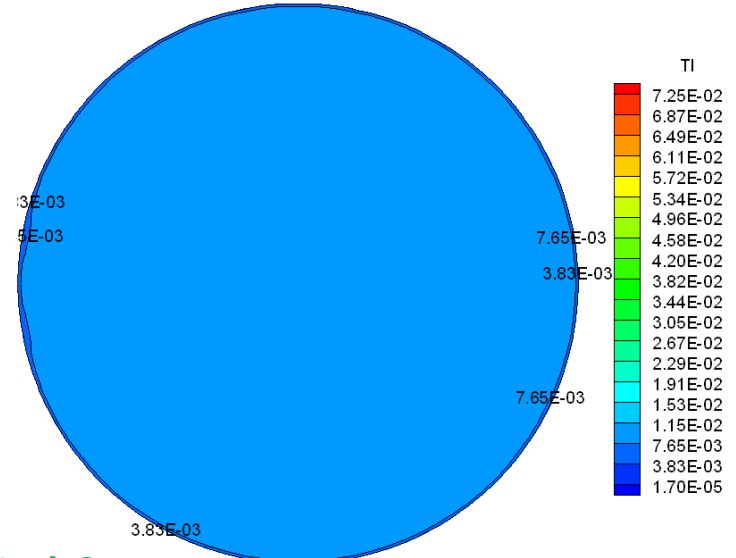
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

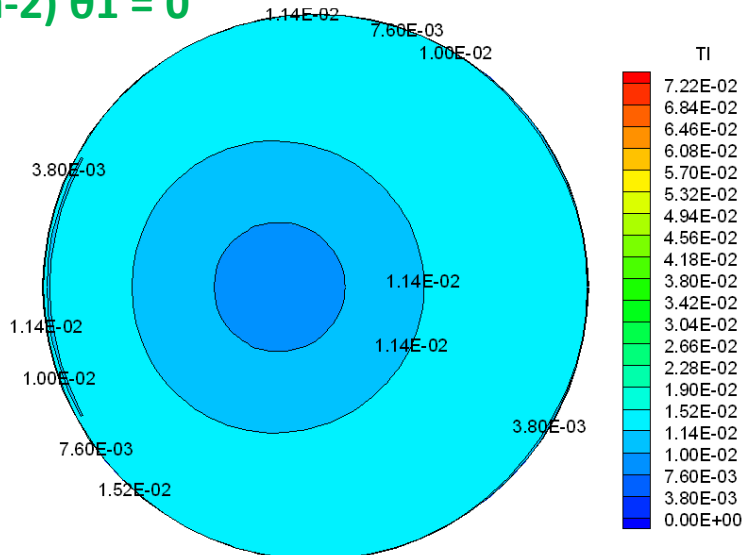
(a-1) $s = -5.17$



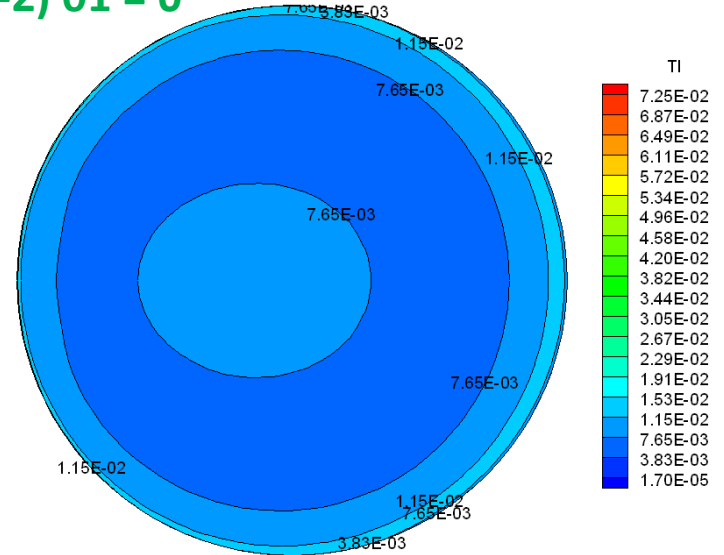
(d-1) $s = -5.17$



(a-2) $\theta_1 = 0$



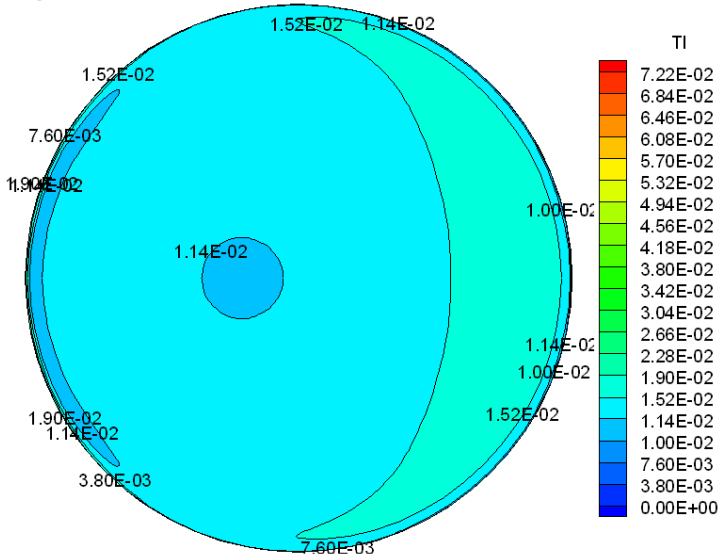
(d-2) $\theta_1 = 0$



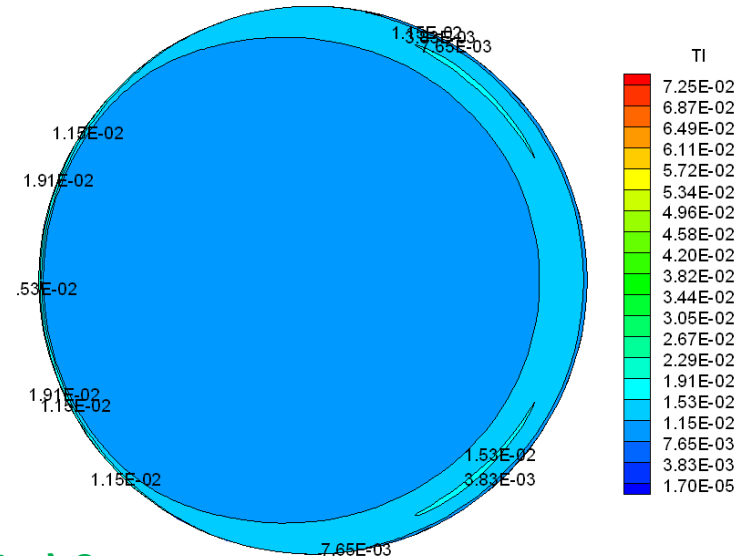
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

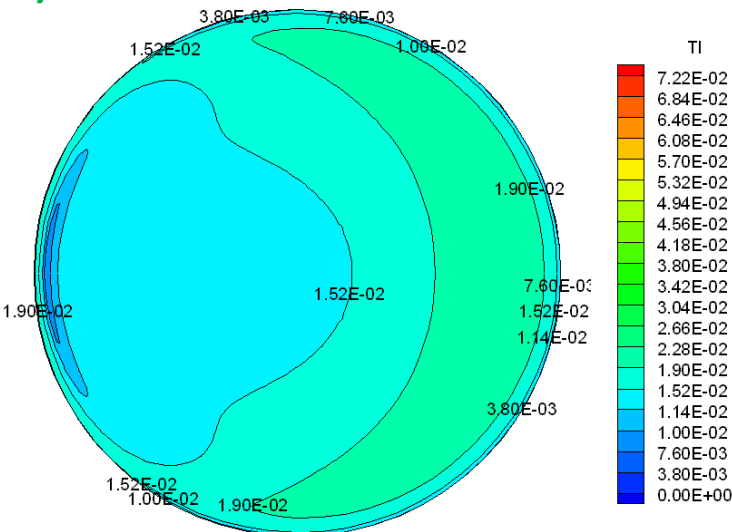
(a-3) $\theta_1 = 30$



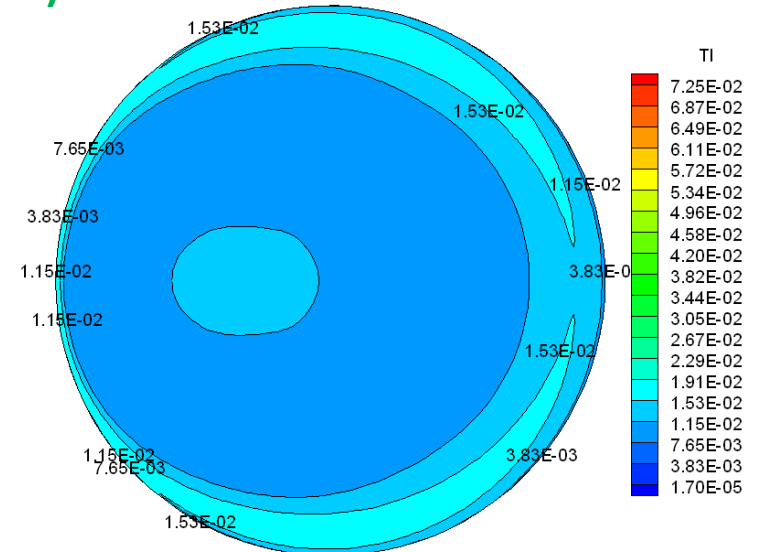
(d-3) $\theta_1 = 30$



(a-4) $\theta_1 = 60$



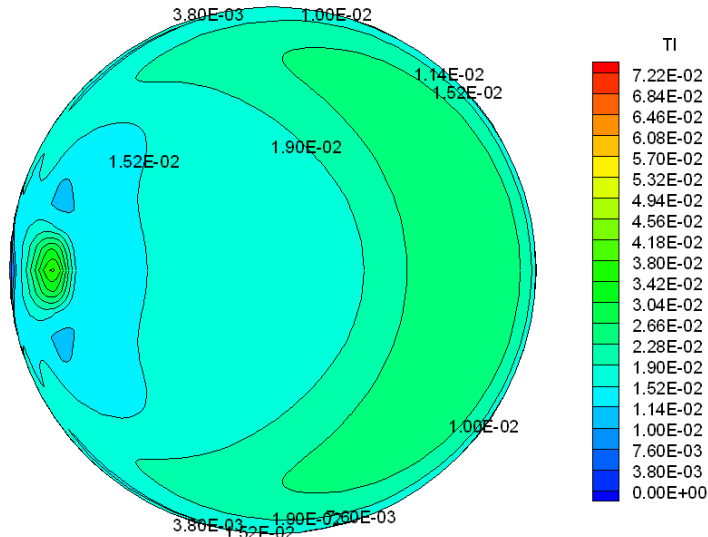
(d-4) $\theta_1 = 60$



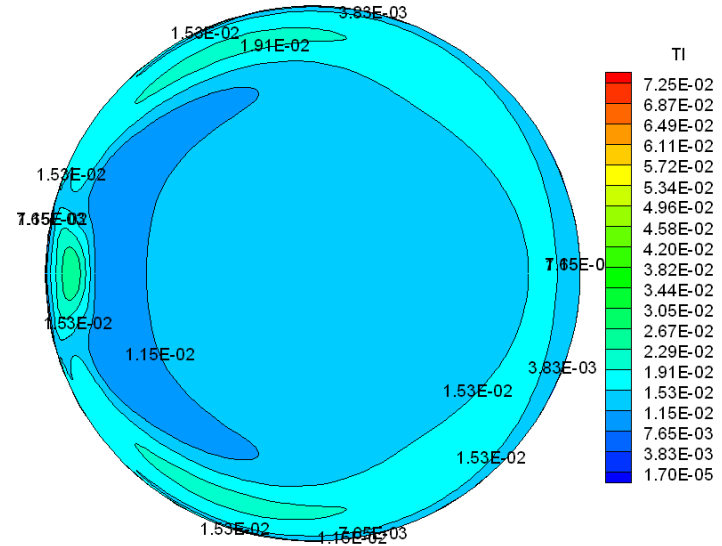
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

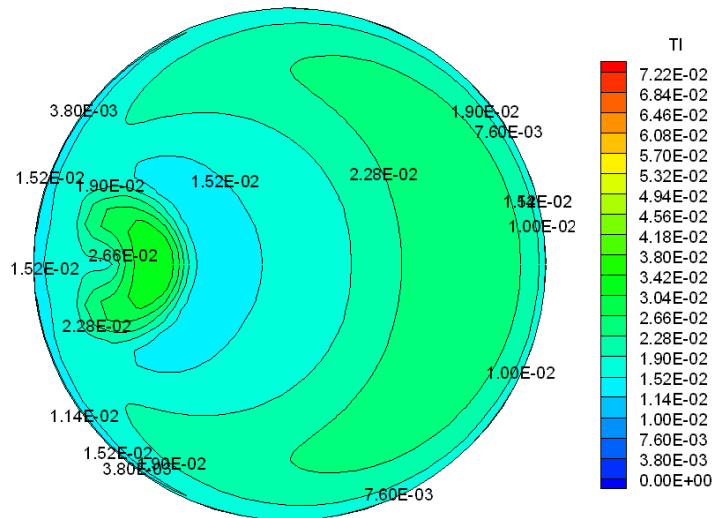
(a-5) $\theta_1 = 90$



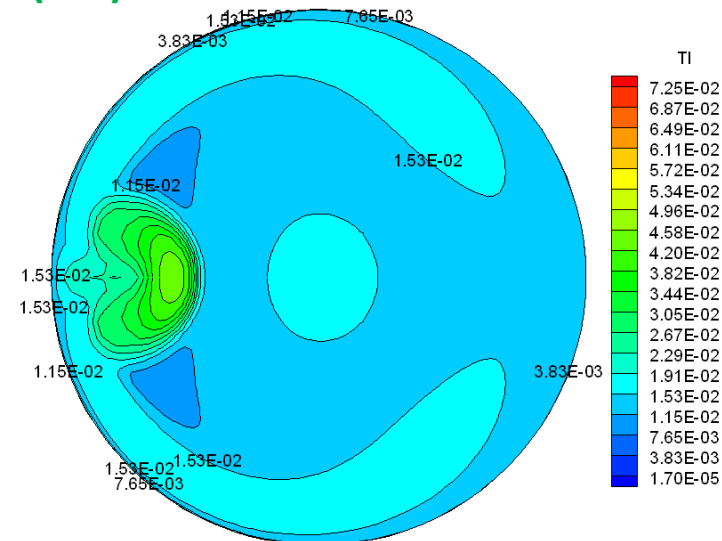
(d-5) $\theta_1 = 90$



(a-6) $\theta_2 = 0$



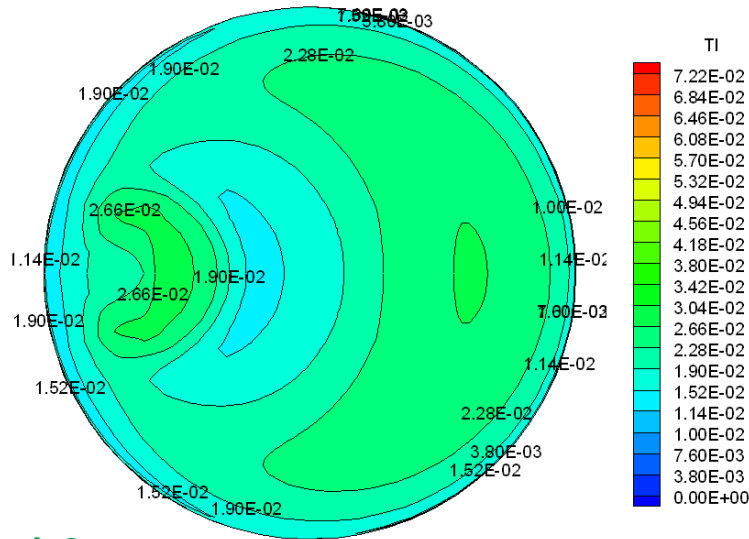
(d-6) $\theta_2 = 0$



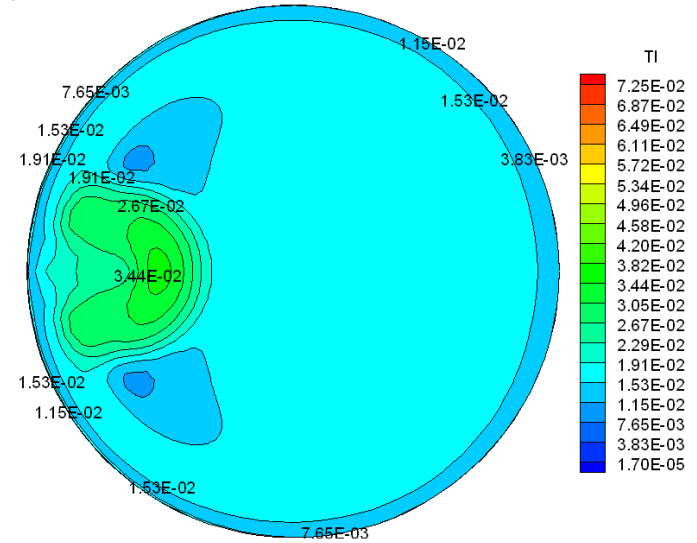
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

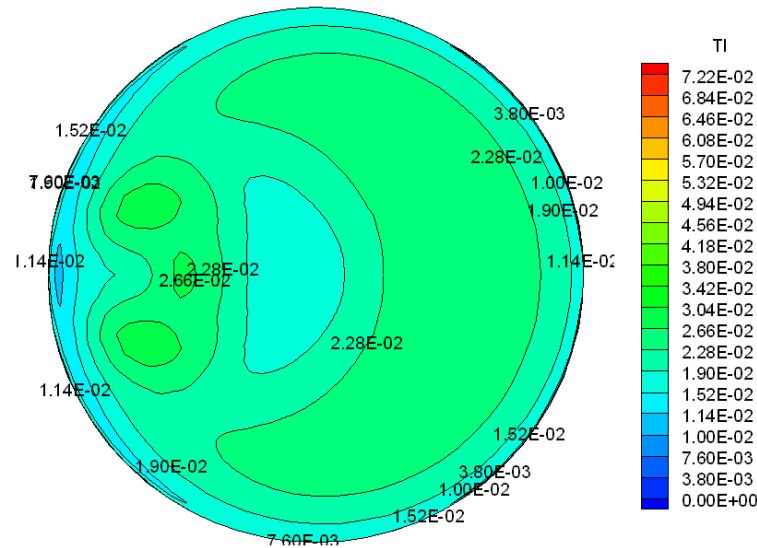
(a-7) $\theta_2 = 30$



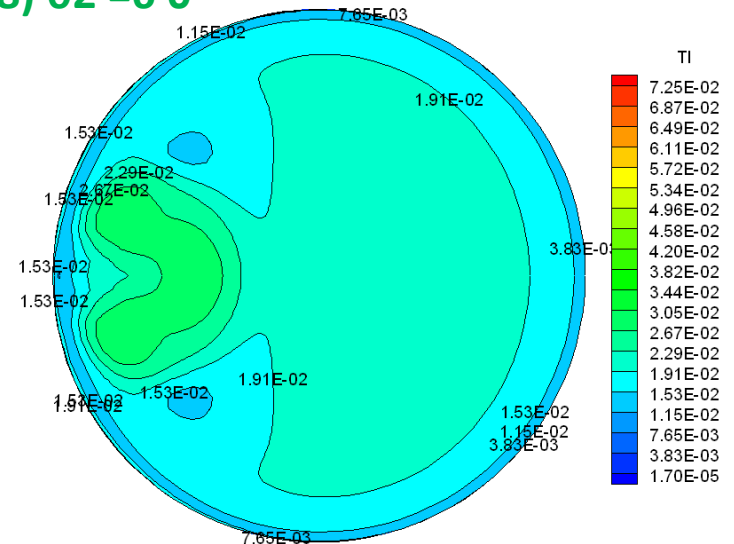
(d-7) $\theta_2 = 30$



(a-8) $\theta_2 = 60$



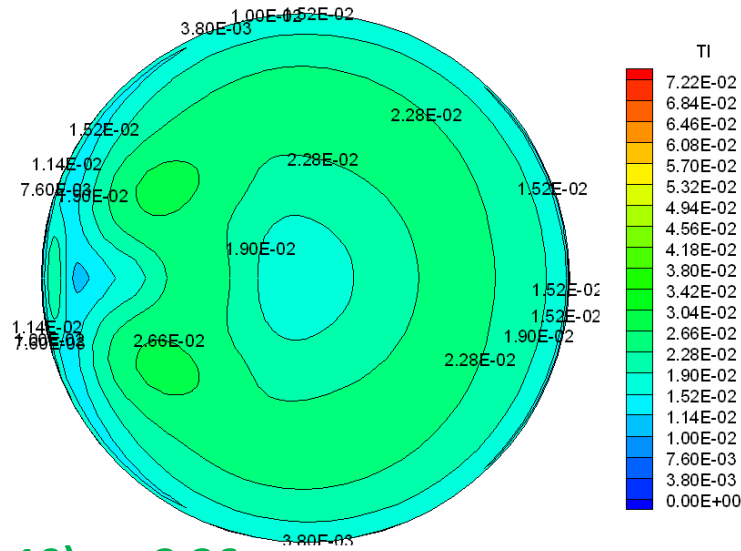
(d-8) $\theta_2 = 60$



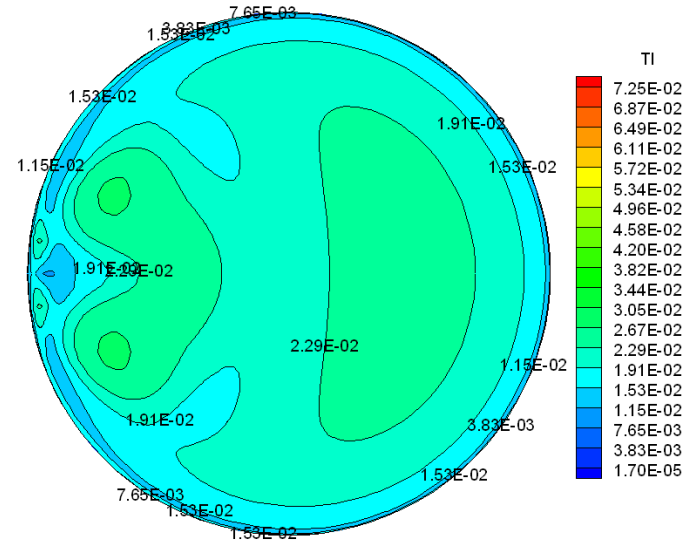
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

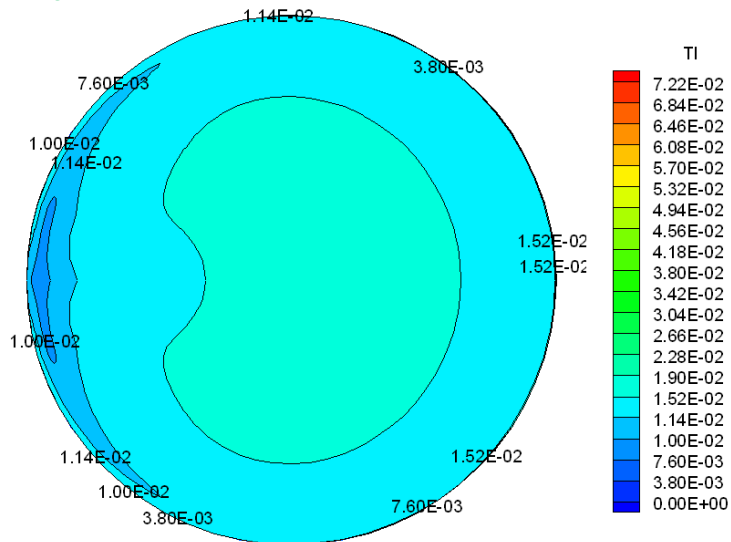
(a-9) $\theta_2 = 90$



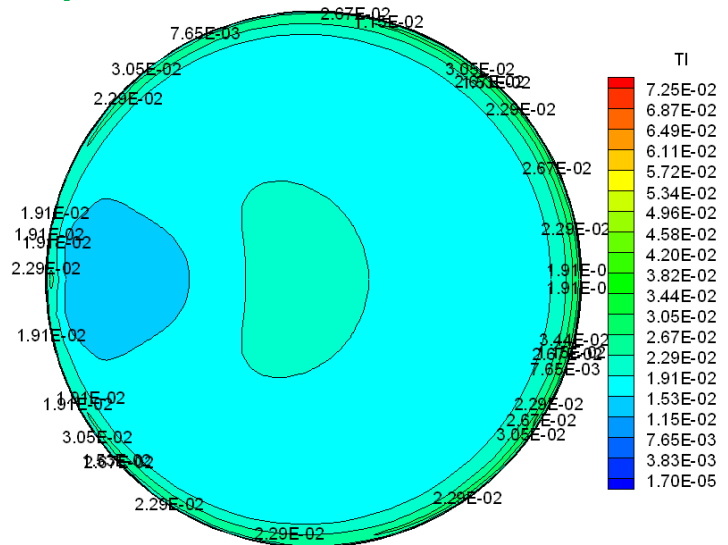
(d-9) $\theta_2 = 90$



(a-10) $s = 3.36$



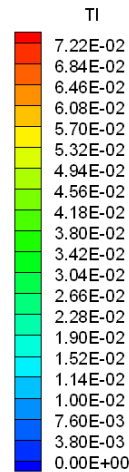
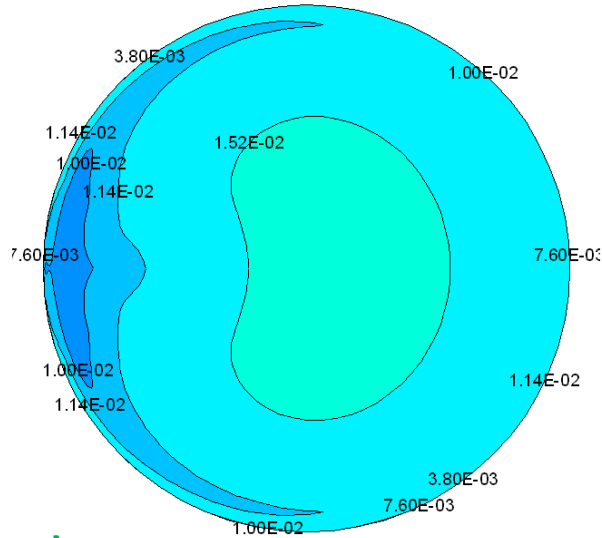
(d-9) $s = 3.36$



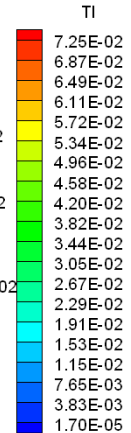
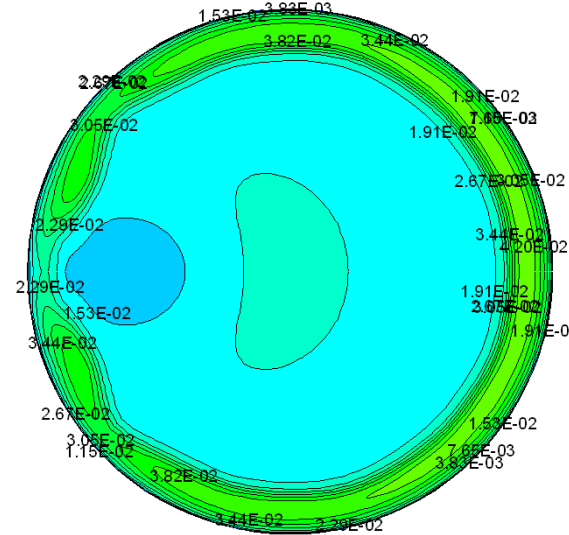
Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

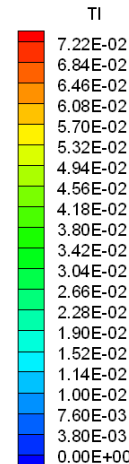
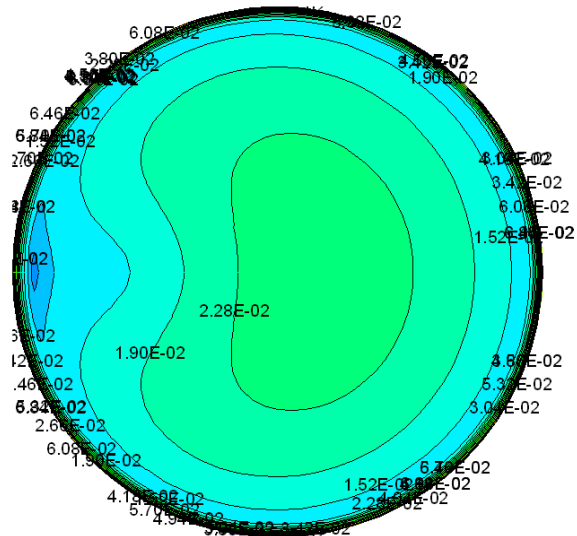
(a-11) $s=4.032$



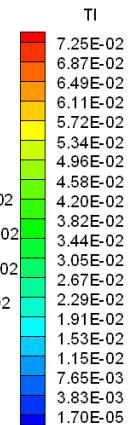
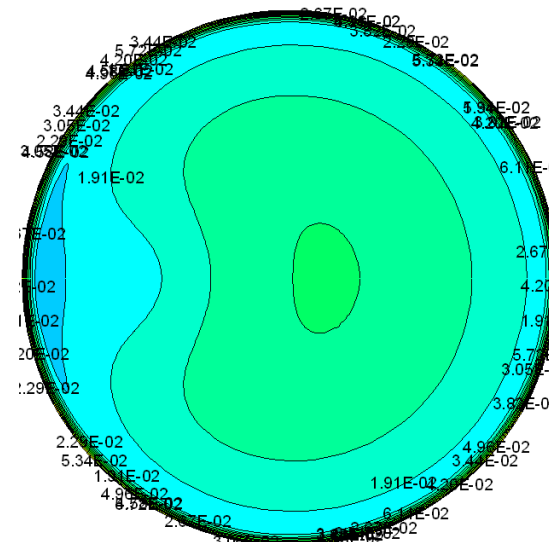
(d-11) $s = 4.032$



(a-12) $s = 6.87$



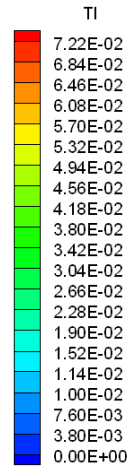
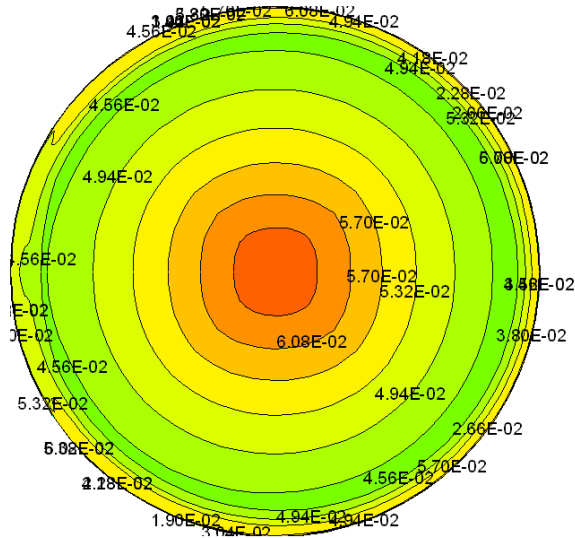
(d-12) $s = 6.87$



Contour of Turbulence Intensity in Tecplot

— Comparison Between Pipe with/without A Weld

(a-13) $s = 8.3375$



(d-13) $s = 8.3375$

