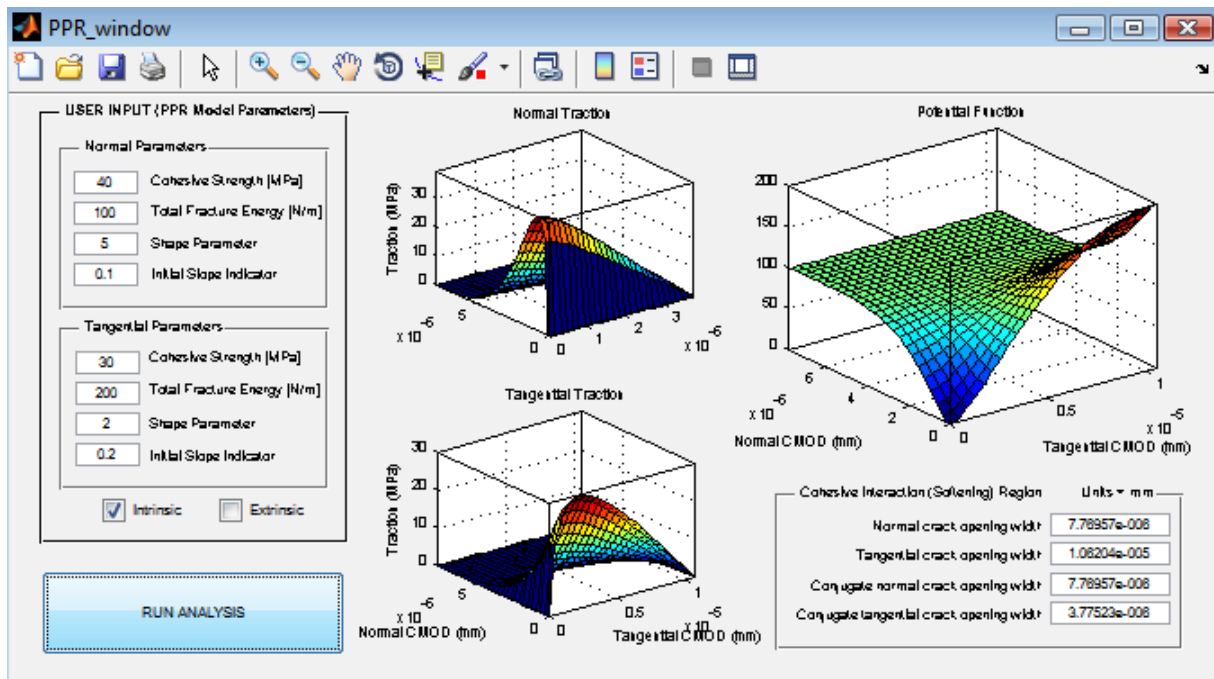


INTRODUCTION TO THE PPR (PARK-PAULINO-ROESLER) MODEL GRAPHICAL USER INTERFACE (GUI)

- This document provides instructions on how to use the graphic user interface (GUI) for PPR cohesive zone model.
- The purpose of the GUI is to provide the user with a means to visualize the PPR model without worrying about actual implementation details.
- To launch the GUI, download the three companion files into MATLAB.
 - PPR_window.m
 - PPR_window.fig
 - cohesivePPR.m

In the command window of MATLAB type “PPR_window” (minus the quotations) and a GUI will appear that looks similar to:



- The user inputs are on the left hand side of the GUI:

USER INPUT (PPR Model Parameters)

Normal Parameters

Cohesive Strength [MPa]

Total Fracture Energy [N/m]

Shape Parameter

Initial Slope Indicator

Tangential Parameters

Cohesive Strength [MPa]

Total Fracture Energy [N/m]

Shape Parameter

Initial Slope Indicator

Intrinsic Extrinsic

← Strength of material in pure mode I loading

← Area under Load-CMOD curve in pure mode I loading

← See below for explanation

← Initial penalty stiffness for intrinsic elements only

← Strength of material in pure mode II loading

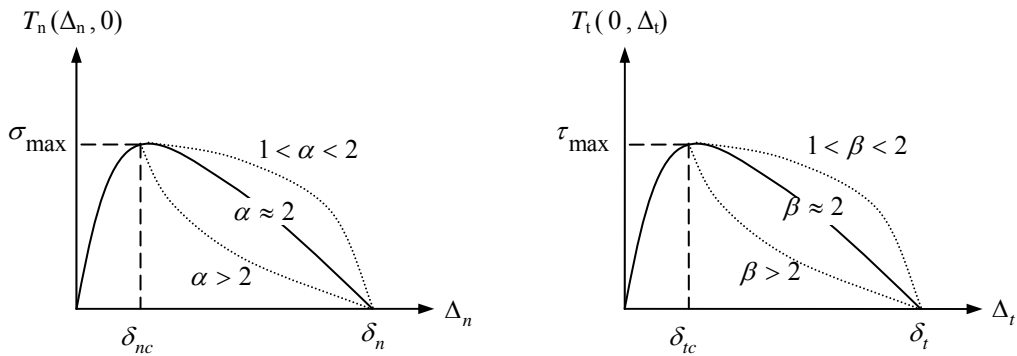
← Area under Load-CMOD curve in pure mode II loading

← See below for explanation

← Initial penalty stiffness for intrinsic elements only

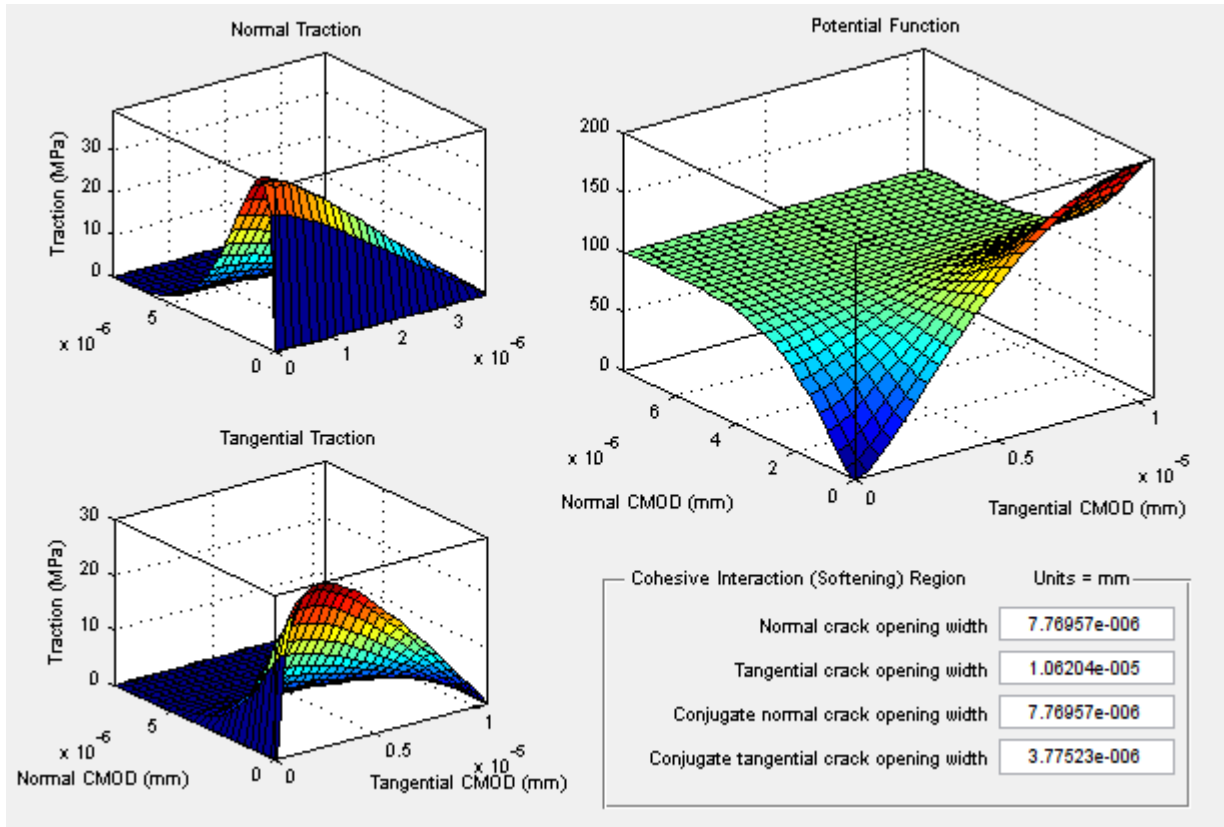
← Chose whether intrinsic or extrinsic model

The shape parameters, asked for in the user input panel α and β , are defined as below for the normal direction (T_n) and the tangential direction (T_t), respectively.



- To run the analysis, push the button labelled “RUN ANALYSIS”, located in the bottom left corner of the GUI.
- **Sample Results**

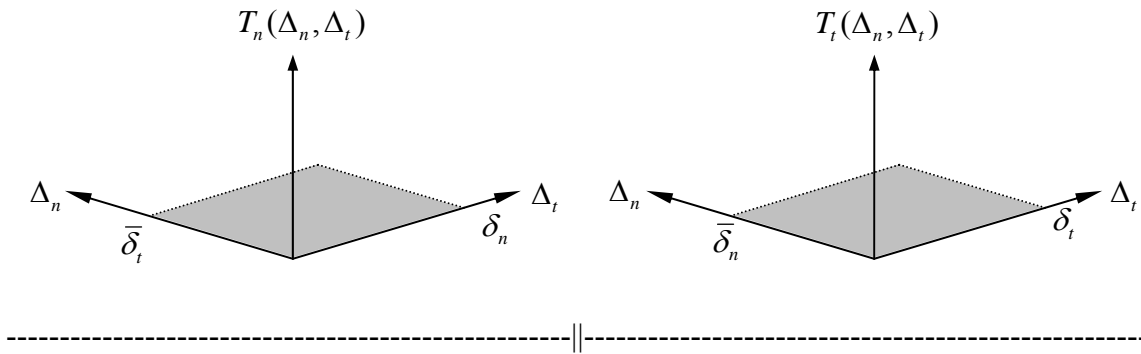
The results of the analysis include plots of the normal traction-separation relationship, the tangential traction-separation relationship, and the potential function, defined in the supporting documentation for both the intrinsic and extrinsic cases.



Also included in the results is a list of the final crack opening widths, defined as follows:

- Normal crack opening width (δ_n),
- Tangential crack opening width (δ_t),
- Conjugate normal crack opening width ($\bar{\delta}_n$), and
- Conjugate tangential crack opening width ($\bar{\delta}_t$)

seen plotted in the figure below.



All of the mathematical formulations are provided in the supporting documentations and presentations, found on the website where the MATLAB files were downloaded.