# Methodologies

Full details of the methods used to create the datasets are provided in:

Yang, Y., Orr, J., Ibell, T. and Darby, A. (2015) Shear strength theories for beams of variable depth. In: IASS2015 Annual International Symposium on Future Visions IASS/ISOFF, 2015- 08-16 - 2015-08-20, Amsterdam.

# Scripts

The modelling of the tapered beam in the paper is based on Matlab 2013b. Two different sets of scripts were provided. The first one named after shear stress calculation controls the calculation of the example modelling of shear force of variable depth beam. The second one named after test data comparison controls the shear stress calculation of the tested tapered beam.

The input files of the first set of scripts include ‘fullprocess\_fully\_cracked\_txy\_txye\_udl\_udlprofile’ which is the main body of the shear stress calculation and the script ‘tensioncrack’ which is a function script to work with the main body. They must be in the same folder when run them with matlab. The second set of scripts includes: ‘EC2\_Beam2\_M’, ‘EC2\_Beam3\_M’ and ‘crack’ which is also a function script. They need to be in the same folder.

These input files are written by the author himself and they are the part of the author’s PhD research. In the test data comparison session, the input data comes from:

Orr JJ, Ibell TJ, Darby AP, Evernden M. Shear behaviour of non-prismatic steel reinforced concrete beams. Engineering Structures. 2014;71:48-59.

# Output Files

There are three parts of the datasets calculated from the input files including:

 17032015EC2\_Beam2\_M

 17032015EC2\_Beam3\_M

 results\_udl\_udlprofile\_0128

All the datasets are the raw data calculated based on the methods stated in the conference paper. The processed data are presented in the excel files including:

 EC2\_Beam2\_M

 EC2\_Beam3\_MV

 shear stress distribution for example

# Dataset variables

The processed variables in the excel files including:

In ‘shear stress distribution for example’

z The distance from top of the beam of all cross sections

docn The difference of the normal stress of the calculation point of Timoshenko method.

doce The difference of the normal stress of the calculation point of effective shear force method.

txy The shear stress of the calculation point of Timoshenko method

txye The shear stress of the calculation point of effective shear force method

Ve The effective shear force

Vc The proportion of effective shear force applied on concrete of Timoshenko method.

Vf The proportion of effective shear force applied on CFRP of Timoshenko method.

Vce The proportion of effective shear force applied on concrete of effective shear force method.

Vfe The proportion of effective shear force applied on CFRP of effective shear force method.

In ‘EC2\_Beam2\_M’ and ‘EC2\_Beam3\_MV’

N The label of the cross sections

Y The effective depth of the cross sections

T The tensile force in the CFRP flexural reinforcement

D The depth of the compression area of the beam

Txy The shear stress distribution of the cross section

Vc The shear force assumed to be undertaken by compressive concrete according to shear stress calculation

Vs The shear force assumed to be carried by cracked concrete according to shear stress calculation

Tv The shear force carried by inclined reinforcement

V The shear force carried by the cross section