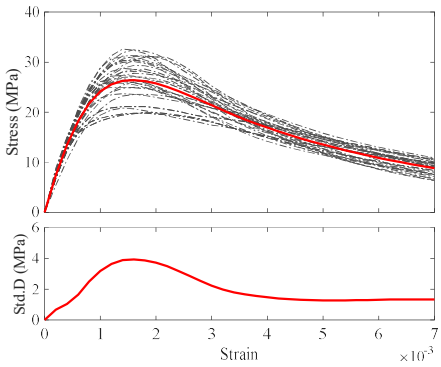
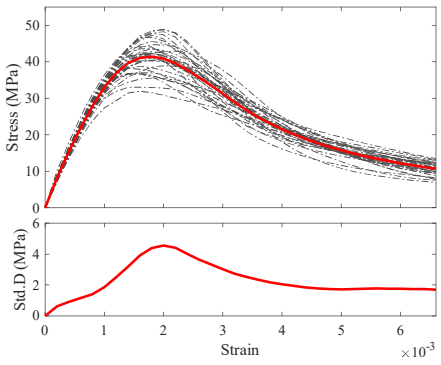
Background

1 Specification

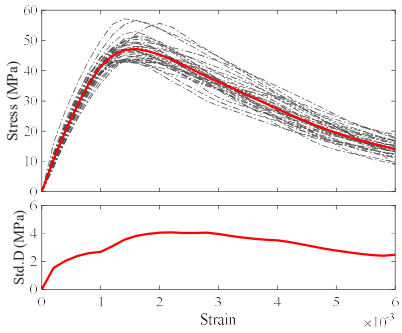
The tested complete stress-strain curves of concrete under uniaxial compression in the text file, as shown in Fig. 1, came from Ren et al. (2008), Yan et al. (2016) and Tao et al. (2020). The specifications of the test data are shown in Table 1. The mix proportion of concrete by weight is shown in Table 2.



(a) C30



(b) C40



(c) C50

Fig. 1 Tested complete stress-strain curves of concrete

Table 1 The specifications of the test data

Strength grade	Specimen size (mm)	Numbers	Ultimate strain	Strain rate (1/s)
C30	150×150×300	33	0.007	10^{-5}~10^{-3}
C40		33	0.0066	10^{-5}~10^{-3}
C50		33	0.006	10^{-5}~60^{-3}

Table 2 Concrete mix proportion by weight (kg/m^3)

Strength grade	Water	Portland cement	Sand	Gravel (5~25 mm)	Fly ash	Slag	Superplasticizer
C30	117	225	853	1042	52	69	4.5
C40	162	250	796	1034	58	77	3.47
C50	111	254	817	1026	72	97	4.23

2 Use and Restrictions

For those interested in using these test data, please feel free to use it subject to the constraints described in the Restrictions. Use of the data in any derivative work (defined here as a thesis, dissertation, conference paper, journal paper, engineering report, etc.) requires the citations of the test data references.

Restrictions: The test data provided here are intended to serve the profession for educational purposes within professional environments. Furthermore, this data may not be used for direct profit, e.g., within proprietary software, without explicit agreement. The use of this data within an unauthorized manner, as described herein, shall result in the forfeit of the right to use the data and the associated monetary gross revenues. Breach of this restriction shall result in prosecution.

References

[1] X Ren, W Yang, Y Zhou, et al. Behavior of high-performance concrete under uniaxial and biaxial loading[J]. ACI materials journal, 2008, 105(6): 548-557.

[2] X Yan, X Ren, J Li. Experimental study of full process variability of concrete under uniaxial compression[J]. Journal of Tongji University (Natural Science), 2016, 05: 664-670. (in Chinese)

[3] J Tao, J Chen, X Ren. Copula-Based Quantification of Probabilistic Dependence Configurations of Material Parameters in Damage Constitutive Modeling of Concrete [J]. Journal of Structural Engineering, 2020, 146 (9), 04020194.