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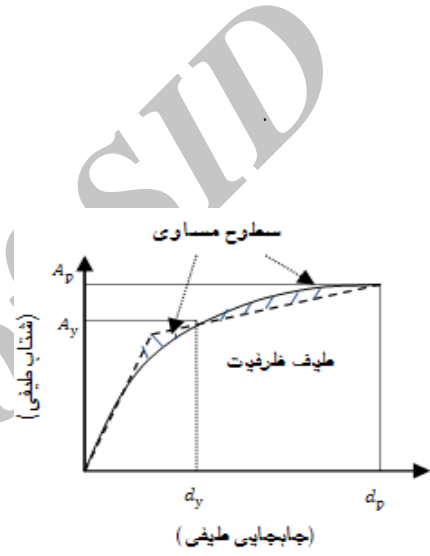
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$$DI_{P\&A} = \frac{\theta_m - \theta_r}{\theta_u - \theta_r} + \frac{\beta E_h}{M_y \theta_u} \quad (۱)$$

θ_m :
 θ_r θ_u
 β M_y
 E_h

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$$DI_{\mu} = \frac{u_{max} - u_y}{u_{mon} - u_y}$$

u_y

u_{max}

u_{mon}

(۳)

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$$DI_{Drift} = \frac{\Delta_m}{H}$$

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Δ_m

H (

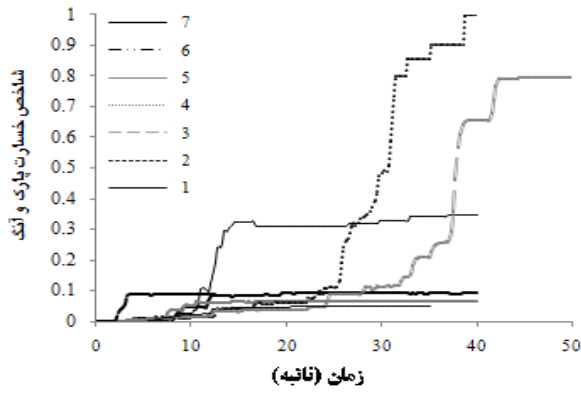
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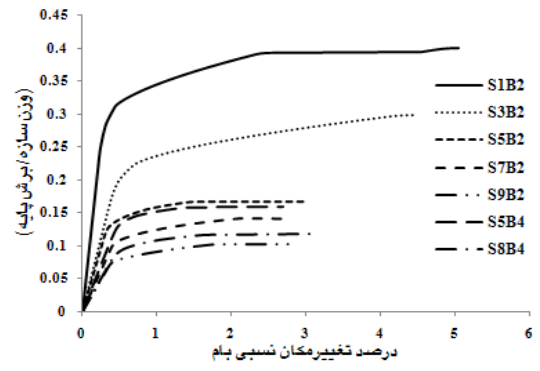
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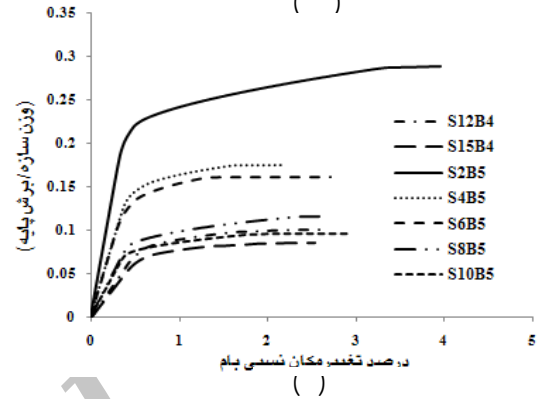




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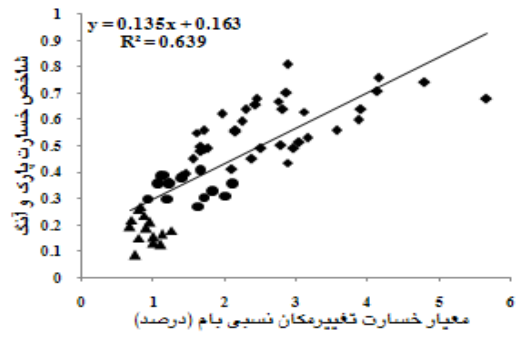
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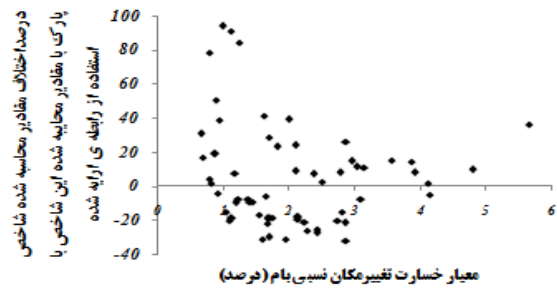
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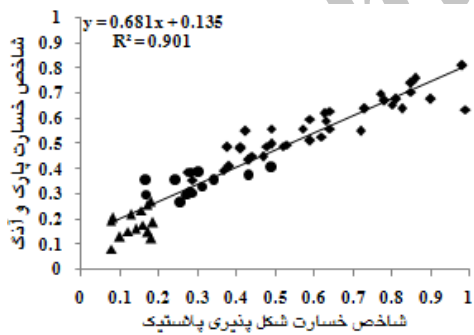
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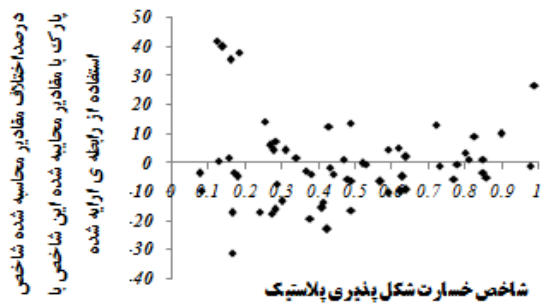
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- Estekanchi H, Arjomandi K, "Comparison of damage indexes in nonlinear time history analysis of steel moment frames" Asian Journal of civil engineering(building and housing).8, PP629-646,2007. []
- Estekanchi .H, Arjomandi .K and Vafai .A, "Estimating structural damage of steel moment frames by Endurance Time method" Journal of Constructional Steel Research.64, PP145-155,2008. []
- Falerio S. Oller S and Barbat A, "Plastic-damage seismic model for reinforced concrete frames" Computers and Structures.86, PP581-597,2008. []
- Federal Emergency Management Agency, FEMA273. "NEHRP Guidline for The Seismic Rehabilitation of Building", Building Seismic Safety Council, Washington DC.1997. []
- FEMA440, "Improvement of nonlinear static seismic analysis procedures", Federal Emergency Management Agency, Washington,DC.2005. []
- Ghobarah A, Abou-Elfath H, Biddah A, "Response-Based Damage Assessment of Structures", Earthquake Engng. Struct. Dyn. Vol. 28, 1999, PP79-104. []
- Park Y.J., Ang A.H.S, "Mechanistic Seismic Damage Model for Reinforced Concrete", Journal of Structural Engineering, ASCE, Vol. 111, No. 4, PP.722-739,1985. []
- Powell H.Graham and Allahabadi R., ""Seismic damage prediction by deterministic methods" Concepts and Procedures, Erthquake Engineering and Structural Dynamics, Vol. 16, 719-734,1988. []
- Usami, T., and Kumar, S. "Inelastic seismic design verification method for steel bridge piers using a damage index based hysteretic model." Engineering structures, Vol.20, PP. 472-480.1998. []
- Valles, R.E; Reinhorn, A.M; Kunnath, S.K; Li4, C and Madan .A, "IDARC version 4.0:a program for the inelastic damage analysis of reinforced concrete structures" Technical Report NCEER-96-0010, National Center For Earthquake Engineering Research, State University of New York at Buffalo. 1996. []
- Zhang X, Wong K, Wang Y, "performance assessment of moment resisting during earthquakes base on the force analogy method" Engineering Structures.29, PP2792-2802,2007. []
- " []
- " []
- Applied Technology Council, ATC40; "Seismic Evaluation and Retrofit of Concrete Buildings California Seismic Safety Commission", 1997. []
- Bracci, J.M. and Reinhorn, A.M. and Mander, J.B. and Kunnath, S.K.; "The Deterministic model for seismic damage evaluation of RC structures", Technical Report NCCEER-89-0033, National Center for earthquake Engineering Research, State University of New York, Buffalo NY.1989. []
- Cakmak, A.S, Dipasquale E, "Identification of the serviceability limit state and detection of seismic structure damage" Report NCEER-88-0022, National Center for Earthquake Engineering Research, State University of New York at Buffalo, NY, 1988. []
- Cakmak, A.S, Dipasquale E, "On the relation between local and global damage indices". Technical Report NCEER-89-0034, State University of New York at Buffalo, 1989. []
- Cakmak, A.S. and Dipasquale, E., "Seismic damage assessment using linear models". Soil Dynamics and Earthquake Engineering; No.4, 9; 194-215; 1990. []
- Chellini G, De Roeck G, Nardini L, Salvatore W, "Damage analysis of a steel-concrete composite frame by finite element model updating" Journal of Constructional Steel Research.66, PP398-411,2010. []
- Chopra AK,Goel RK. "Capacity-demand-diagram-methods for estimating seismic deformation of inelastic structures:SDF Systems". Report No.PEER-1999/02.Berkeley(CA):Pacific Earthquake Engineering Research Center, University of California at Berkeley. 1999. []
- Colombo .A, Negro .P, "A damage index of generalized applicability" Engineering Structures.27, PP1163-1174, 2005. []

¹ Acceleration Displacement Response Spectrum

² Operational

³ Immediately Occupancy

⁴ Life Safety

⁵ Collapse Prevention

⁶ Local

⁷ Global