

# Table of contents

Preface	V
Opening address <i>Wilfried B. Krätzig</i>	VII
Welcome address <i>M. Bormann</i>	IX
Welcome address <i>A. N. Kounadis</i>	XI
Obituary <i>O. T. Bruhns</i>	XIII
Contributions of Karl-H. Schrader to Structural Dynamics <i>Gerhart I. Schuëller</i>	XV
Conference organization	XIX
 <b>1 Impact</b>	
Structural dynamic plasticity effects due to impact or vibrational loadings <i>Franz Ziegler, Peter Fotiu &amp; Hans Irschik</i>	3
Analysis of impact induced vibrations including material nonlinearities of reinforced concrete <i>Friedhelm Stangenberg &amp; Dieter Schwarzkopp</i>	11
Strain rate effects on the mechanical behaviour of microconcrete <i>B. Hwaija, C. Y. Chiem &amp; J. G. Sieffert</i>	17
Impact problems in structural mechanics – A theoretical and numerical treatment <i>P. Wriggers &amp; E. Stein</i>	25
A dynamic testing method for structural concrete <i>Oswald Klingmüller</i>	33
Dynamic response of a plate to an explosion <i>J. Renard &amp; C. Desrosier</i>	39

Computation of a concrete structure transient response to a very short time loading including damage modelling <i>P.Bailly</i>	47
Elastic and plastic waves in spatial trusses <i>Ulrich Bernhard &amp; Werner Hauger</i>	53
Microcrack development during high strain rate loading of concrete in compression <i>P.H.Bischoff, H.Bachmann &amp; J.Eibl</i>	59
Influence of strain rate on material properties and on R.C. structural behaviour <i>E.Limberger &amp; K.Brandes</i>	67
Missile-structure interaction due to extreme impact on reinforced concrete <i>Dieter Schwarzkopp &amp; Rainer Zinn</i>	73
A continuum damage theory for high strain rate deformations of metals with application to impact problems <i>O.T.Bruhns, H.Diehl &amp; W.Fornefeld</i>	81
 <b>2 Dynamic stability</b>	
Finite element analysis of nonlinear dynamic instability phenomena of arbitrary shell structures <i>Y.Basar, C.Eller, W.B.Krätzig &amp; R.Quante</i>	91
Stability of thin-walled elastic structures against finite perturbations <i>Dieter Dinkler</i>	97
Some new instability phenomena in nonlinear discrete systems <i>A.N.Kounadis</i>	103
Dynamic fluid-structure-interaction and stability in storage tank design <i>F.G.Rammerstorfer, K.Scharf &amp; F.D.Fischer</i>	113
Stability of shell structures under time dependent loading <i>Ekkehard Ramm &amp; Albrecht Burmeister</i>	121
Nonlinear dynamic analysis of multiblock structures <i>A.Sinopoli</i>	127
Flow induced instabilities of imperfect three-dimensional elastic tubes <i>J.Schmidt, A.Steindl &amp; H.Troger</i>	135
Dynamic stability of beams under axial forces – Lyapunov exponents for general fluctuating loads <i>Walter V.Wedig</i>	141
The design of dynamic absorbers tuning systems excited parametrically <i>Joachim Baseler</i>	149
Stochastic stability of mechanical systems <i>Christian G.Bucher</i>	155

### 3 Soil dynamics

Multiphase models in soil dynamics <i>H.Cramer &amp; W.Wunderlich</i>	165
Guide values for dynamic soil properties and simplified estimation of dynamic soil spring constants <i>W.Romberg</i>	173
FEM-Analysis for time-depending cyclic pore water cohesive soil problems <i>Lutz Pisarsky, Hermann Ahrens &amp; Heinz Duddeck</i>	179
On the Poisson's ratio of soils <i>U.Güttler</i>	187
An experimental criterion for evaluating heavy tamping compaction of soils <i>J.G.Sieffert &amp; G.Thiel</i>	195
Laboratory measurement of the dynamic shear modulus of soils <i>Wolfgang A. Haupt &amp; Surendra Kumar</i>	201
Soil stiffness and damping <i>M.D. Bolton &amp; J.M.R. Wilson</i>	209
Vibratory signature of overhead line towers on their prestressed foundations <i>M.P.Luong</i>	217
Reliability of soil sublayers under earthquake excitation <i>K.J.Mørk &amp; S.R.K. Nielsen</i>	225
Dynamic non destructive testing of footing stiffness <i>P.Lepert &amp; J.-L. Briaud</i>	237
Optimum shock isolation <i>A.Agić</i>	245
Stability and liquefaction of subsea slopes due to earthquake loading <i>F.Molenkamp</i>	251
The influence of local site conditions on the site response analysis <i>H.-G.Schmidt &amp; F.Cigan</i>	259
Wave propagation in saturated, fissured, poroelastic rocks <i>D.E. Beskos &amp; I.Vgenopoulou</i>	267
Nonlinear soil dynamic models based on performed laboratory tests <i>Kosta Talaganov, Irena Zafirova &amp; Misko Cubrinovski</i>	273

### 4 System identification

Recent trends in system identification <i>H.G.Natke</i>	283
Localization of errors in computational models using dynamic test data <i>G.Lallement &amp; H.Andriambololona</i>	291

Time domain identification of nonlinear vibrational systems <i>G. Renker &amp; H. Waller</i>	299
Localization of errors in computational models using dynamic test data <i>Michael Link</i>	305
Parameter identification through uncertain compliance transfer function of vibration system <i>H. Takabatake &amp; S. Nakagiri</i>	315
Nonlinear structural identification by the Hilbert Transform <i>Paolo Foraboschi, Vittorio Gusella &amp; Andrea Vignoli</i>	323
System identification as tool for the systematic correction of Finite-Element models <i>C.-P. Fritzen, S. Zhu &amp; Th. Kiefer</i>	331
Mechanical systems in ARMAX representation <i>M. Zamirowski</i>	339
On the optimum experimental design for the parametric identification of linear elastomechanical systems <i>N. Cottin</i>	347
Dynamic identification of a large glue-laminated timber roof structure <i>A. Ceccotti, N. De Robertis, P. Spinelli &amp; A. Vignoli</i>	355
The possibility of dynamic diagnostics at high cooling towers <i>Barbara Hauptenbuchner &amp; Milan David</i>	363
Fault detection and localization by vibration monitoring with observers <i>H. Waller &amp; R. Schmidt</i>	369
Modal parameters for masonry structures through system identification techniques <i>G. Benzoni &amp; W.D. Iwan</i>	377
Assessment of active alternatives for the control of long span bridge dynamics – Implication for train runnability <i>A. Carotti &amp; R. Chiappulini</i>	385
Fault diagnosis in mechanical structures by means of vibration due to impact <i>C. Cempel &amp; H.G. Natke</i>	393
Study of dynamic behaviour of an old masonry building <i>D. Capecchi &amp; F. Vestroni</i>	399
Dynamic tests of a chemical process module (video clip) <i>F.-O. Henkel, H. Kennerknecht &amp; P. Leister</i>	407
System identification as a tool for mathematical modelling in earthquake engineering <i>D. Jurukovski &amp; O. Jovanović</i>	413
The significance of system identification for diagnostic dynamic testing of bridges <i>R.G. Flesch, W.J. Gerasch &amp; K. Kernbichler</i>	419

## 5 Earthquake engineering

Historical earthquake damages in Istanbul <i>N.Çamlıbel</i>	429
On earthquake resistant design of multistorey buildings stiffened by diaphragm action <i>K.-H.Schrader, E.Reyer &amp; O.A.Oji</i>	435
Eurocode 8 – General presentation <i>Horst Bossenmayer</i>	443
Identification of structural schemes for masonry structures from recorded accelerations <i>D.Benedetti &amp; G.Benzoni</i>	449
Parametric identification of equivalent models for masonry structures <i>C.Gentile</i>	457
A knowledge-based approach to the numerical treatment of constitutive laws for cyclic loading <i>U.Hanskötter, W.B.Krätzig, K.Meskouris &amp; W.Zahlten</i>	465
Mathematical modelling of reinforced concrete structural walls for nonlinear seismic analysis <i>P.Fajfar &amp; M.Fischinger</i>	471
Analysis of building pounding due to earthquake <i>S.A.Anagnostopoulos &amp; K.V.Spiliopoulos</i>	479
Analyses of differences in damages of similar buildings on the same location caused by earthquakes <i>M.Milicevic &amp; S.Zdravkovic</i>	485
Large displacement nonlinear dynamic analysis of space frames <i>B.A.Izzuddin, A.S.Elnashai &amp; P.J.Dowling</i>	491
Braced steel frames with hysteretic dampers <i>A.Pocanschi, O.Krause &amp; B.Haendel</i>	497
Nonlinear uplift analysis of a liquid storage tank <i>Lun Ma &amp; William A.Nash</i>	503
The composite structures - A contribution to earthquake resistance of buildings <i>R.Pepin &amp; J.-B.Schleich</i>	509
A proposal for evaluating the behaviour factor by the results of the pseudodynamic test method <i>S.Sorace &amp; A.Vignoli</i>	515
Approximate modal analysis of yielding wall structures under seismic excitation <i>E.Keintzel</i>	523
Improved calculation algorithms for the response spectrum method <i>L.Fischer</i>	531



## 6 Earthquake engineering – R/C structures

Ductility demand of 3-D reinforced concrete frames under seismic excitation <i>Thomas Wenk &amp; Hugo Bachmann</i>	537
Behaviour of R/C columns under static compression and lateral cyclic displacement applied out of symmetrical planes <i>Juan José Garçía González, Jacques Lamirault &amp; Jean-Georges Sieffert</i>	543
Damage assessment in cyclically loaded reinforced concrete columns <i>B.Garstka, W.B.Krätzig, K.Meskouris, I.F.Meyer &amp; F.Stangenberg</i>	551
Biaxial column element for nonlinear dynamic analysis of space-frame reinforced concrete structures <i>Manolis G.Sfakianakis &amp; Michael N.Fardis</i>	557

## 7 Earthquake engineering-steel structures

Implementation of cyclic test results from beam to column connections in the analysis of frame structures under seismic actions <i>G.Sedlacek, B.Hoffmeister, S.K.Kook, J.Kuck &amp; T.Nguyen</i>	567
Steel-concrete composite shear connections under severe cyclic loading <i>K.Roik, U.E.Dorka &amp; C.Meinsma</i>	575
Behaviour of thin-walled steel elements under monotonic and cyclic loading <i>I.Vayas &amp; I.N.Psycharis</i>	579
Strain rate sensitive cyclic behaviour of steel bolted joints experimental research <i>K.Brandes</i>	585
Design of a fast running centrifuge in a slender steel framework by calculation and measurement <i>P.Leister, H.Kennerknecht &amp; F.-O.Henkel</i>	589
Author index	