

**Scuola di Dottorato "Leonardo da Vinci"
Università di Pisa**

**Bibliografia del Corso “Meccanica dei Continui”
Gianpietro Del Piero
(Ottobre-Dicembre 2009)**

Nota: I lavori di W. Noll contrassegnati con (*) sono ristampati in:

The Foundations of Mechanics and Thermodynamics, Selected Papers by W. Noll, Springer 1974

Riferimenti generali

Brézis H., *Analyse Fonctionnelle, Théorie et Applications*, Masson 1983. Ed. italiana: *Analisi Funzionale, Teoria e Applicazioni*, Liguori 1986

Ciarlet P.G., *Mathematical Elasticity*, Vol.1, North-Holland 1988

Dacorogna B., *Introduction au calcul des variations*, Presses Polytechniques et Universitaires Romandes, Lausanne 1992. Ed. inglese: *Introduction to the Calculus of Variations*, Imperial College Press 2004, distr. World Scientific, Singapore.

Dixmier J., *General Topology*, Springer 1984

Gurtin M.E., *The Linear Theory of Elasticity*, Handbuch der Physik VIa/2, Springer 1972

Gurtin M.E., *An Introduction to Continuum Mechanics*, Academic Press, 1981

Halmos P.R., *Finite-dimensional vector spaces*, Litton Educational Publishing 1958, Springer 1974

Kolmogorov A.N., S.V. Fomin, *Introductory Real Analysis*, Prentice-Hall 1970, Dover 1975

Noll W., *A mathematical theory of the mechanical behavior of continuous media, Arch. Rational Mech. Anal. 2, 197-229, 1958

Noll W., *Lectures on the foundations of continuum mechanics and thermodynamics, Arch. Rational Mech. Anal. 52, 62-92, 1973

Truesdell C.A., *A First Course in Rational Continuum Mechanics*, Vol.1, 2nd ed., Academic Press 1991

Truesdell, C.A., W. Noll, *The Non-Linear Field Theories of Mechanics*, Handbuch der Physik III/3, Springer 1965

Vol'pert A.I., Hudjaev S.I., *Analysis in Classes of Discontinuous Functions and Equations of Mathematical Physics*, Nijhoff 1985

Capitolo 1

1.1. Spazi euclidei

Coleman B.D., Markovitz H., Noll W., *Viscometric Flows of Non-Newtonian Fluids*, Springer 1966

Noll , cit. rif. gen.

Ogden R.W., *Non-Linear Elastic Deformations*, Ellis Harwood 1984, Dover 1997

1.2. Sottoregioni

Del Piero G., A class of fit regions for continuum mechanics, J. Elasticity 70, 175-195, 2003

Del Piero G., A new class of fit regions, Note di Matematica 27, 55-67, 2007

Noll W., Continuum mechanics and geometric integration theory, in: F.W. Lawvere & S.H. Schnauel eds., *Categories in Continuum Physics*, 17-29, Springer 1986

Noll, W., E.G. Virga, Fit regions and functions of bounded variation, Arch. Rational Mech. Anal. 102, 1-21, 1988

Šilhavý M., The existence of the flux vector and the divergence theorem for general Cauchy fluxes, Arch. Rational Mech. Anal. 90, 195-212, 1985

1.3. Deformazioni

Ciarlet, cit. rif. gen. (problemi di self-contact)

Del Piero 2007, cit. par. 1.2 (funzioni bi-Lipschitz)

Del Piero G., R. Rizzoni, Weak local minimizers in finite elasticity, J. Elasticity 93, 203-244, 2008 (funzioni bi-Lipschitz)

Noll 1973, cit. rif. gen.

Gurtin 1981, cit. rif. gen.

Truesdell & Noll 1965, cit. rif. gen.

1.4. Isometrie, 1.5. Il corpo continuo, 1.6. Moti

Kolmogorov & Fomin 1975, rif. gen. (per l'insieme di Cantor e la funzione di Cantor)

Noll 1973, cit. rif. gen.

Truesdell 1991, cit. rif. gen.

Capitolo 2

2.1. Velocità virtuali, 2.2. Potenza virtuale

Germain P., La méthode des puissances virtuelles en mécanique des milieux continus. Première partie. Théorie du second gradient, J. de Mécanique 12, 235-274, 1973

Germain P., The method of virtual power in continuum mechanics. Part 2. Microstructure, SIAM J. Appl. Math. 25, 556-575, 1973

2.3. Indifferenza

Lanczos C., *The Variational Principles of Mechanics*, Univ. of Toronto Press 1949, Dover 1986

Noll W., *The foundations of classical mechanics in the light of recent advances in continuum mechanics. In: *The Axiomatic Method, with Special Reference to Geometry and Physics*, 266-281, North-Holland 1959

Truesdell & Noll 1965, cit. rif. gen.

2.4. Inerzia

Noll W., *La mécanique classique, basée sur un axiome d'objectivité, In: *La Méthode Axiomatique dans les Mécaniques Classiques et Nouvelles*, 47-56, Gauthier-Villars 1963

Podio Guidugli P., *Inertia and invariance*, Ann. Mat. pura ed appl. 172, 103-124, 1997

2.5. Conseguenze delle leggi di bilancio

Gurtin M.E., L.C. Martins, Cauchy's theorem in classical physics, Arch. Rational Mech. Anal. 60, 305-324, 1976

Gurtin M.E., V.J. Mizel, W.O. Williams, A note on Cauchy's stress theorem, J. Math. Anal. Appl. 22, 398-401, 1968

Noll 1959, cit. par. 2.3,

Noll 1973, cit. rif. gen.

Šilhavý 1985, cit. par. 1.2

Šilhavý M., Cauchy's stress theorem and tensor fields with divergence in L^p , Arch. Rational Mech. Anal. 116, 223-255, 1991

2.6. Continui internamente vincolati

Frémond M., Internal constraints in mechanics, Phil. Tans. Roy. Soc. A, 2309-2326, 2001

Truesdell & Noll 1965, cit. rif. gen.

Capitolo 3

3.1. Variabili di stato, 3.2. Flussi di Cauchy

Gurtin & Martins 1976, par. 2.5

Šilhavý 1985, cit. par. 1.2

Šilhavý 1991, cit. par 2.5

3.3. Pseudobilancio

Del Piero G., On the method of virtual powers in continuum mechanics, J. Mech. Materials and Structures 4, 281-292, 2009

Noll 1973, cit. rif. gen.

3.4. La potenza virtuale interna

Frémond M., Grandes déformations et comportements extrêmes, C. R. Acad. Sci. Paris 337, 24-29, 2009

Frémond M., Nedjar B., Damage, Gradient of damage and principle of virtual power, Int. J. Solids Structures 33, 1083-1103, 1996

Germain 1973, cit. par. 2.1

3.5. Continui con microstruttura, 3.6. Continui micropolari

Capriz G., *Continua with Microstructure*, Springer 1989

Cosserat E., Cosserat F., *Théorie des corps déformables*, Hermann 1909

Eringen A.C., *Foundations of Micropolar Thermoelasticity*, CISM Courses and Lectures, 1970

Mindlin R.D., On the equations of elastic materials with microstructures, Int. J. Solids Structures 1, 73-78, 1965

Muki R., E. Sternberg, The influence of couple-stresses on singular stress concentrations in elastic solids, Zamp 16, 611-648, 1965

Stojanović R., *Mechanics of Polar Continua*, CISM Courses and Lectures n.2, 1969

3.7. Continui del secondo gradiente

Del Piero 2009, cit. par. 3.3

Frémond M., Contact unilatéral avec adhérence - Une théorie du premier gradient, In: G. Del Piero, F. Maceri eds., Proc. 3rd Meeting *Unilateral Problems in Structural Analysis*, Prescudin 1985, CISM Courses and Lectures n.304, 1987

Germain 1973, cit. par. 2.1

Capitolo 4

4.1. Conservazione dell'energia

de Groot S.R., P. Mazur, *Non-Equilibrium Thermodynamics*, North-Holland 1969

Truesdell & Noll, cit. rif. gen.

4.2. Materiali standard generalizzati

- Halphen B., Q.S. Nguyen, Sur les matériaux standards généralisés, *Journal de Mécanique* 14, 39-63, 1975
- Haupt, P., On the mathematical modelling of material behavior in continuum mechanics, *Acta Mechanica* 100, 129-154, 1993
- Moreau J.J., Sur les lois de frottement, de plasticité et de viscosité, *C.R. Acad. Sci. Paris* 271A, 608-611, 1970
- Moreau J.J., On unilateral constraints, friction and plasticity, Proc. School "New Variational Techniques in Mathematical Physics", CIME, Bressanone 1973, Cremonese 1974, 171-322
- Rockafellar R.T., *Convex Analysis*, Princeton Univ. Press 1970
- Ziegler H., Some extremum principles in irreversible thermodynamics with application to continuum mechanics, In: I.N. Sneddon, R. Hill eds, *Progress in Solid Mechanics* 4, 93-193, North-Holland 1963
- Ziegler H., C. Wehrli, The derivation of constitutive relations from the free energy and the dissipation function, In: *Advances in Applied Mechanics* 25, 183-238, Academic Press 1987

4.3. Viscoelasticità

- Breuer S., E.T. Onat, On recoverable work in linear viscoelasticity, *ZAMP* 15, 12-21, 1964
- Graffi D., Sull'espressione dell'energia libera nei materiali viscoelastici lineari,, *Ann. Mat. Pura ed Appl.* 98, 273-279, 1974

4.4. Plasticità perfetta

- Baldacci R., Ceradini G., Giangreco E., *Plasticità*, Italsider 1971
- Drucker D.C., A more fundamental approach to stress-strain relations, Proc. 1st Natl. Congr. Appl. Mech. 487-491, 1951
- Hill R., *The Mathematical Theory of Plasticity*, Oxford University Press 1950
- Lubliner J., *Plasticity Theory*, Macmillan Publ. Co. 1990

Capitolo 5

5.1. Incrudimento cinematico, 5.2. Incrudimento isotropo

- Baldacci, Ceradini, Giangreco, cit. par. 4.4
- Koiter W.T., General theorems for elastic-plastic solids, In: I.N. Sneddon, R. Hill eds, *Progress in Solid Mechanics* 1, 165-221, North-Holland 1960
- Lubliner, cit. par. 4.4

5.3. Plasticità cristallina, 5.4. Viscoplasticità

- Rice J.R., Inelastic constitutive equations for solids: an internal variable theory and its applications to metal plasticity, *J. Mech. Phys. Solids* 19, 433-455, 1971
- Gurtin M.E., On a gradient theory of crystalline plasticity, Research Report 98-CNA-004, Carnegie Mellon University, 1998
- Gurtin M.E., A gradient theory of small-deformation isotropic plasticity that accounts for the Burgers vector and for dissipation due to plastic spin, *J. Mech. Phys. Solids* 52, 2545-2568, 2004

5.5. Elasticità non locale

- Fosdick R.L., Mason D.E., On a model of nonlocal continuum mechanics, Part I. Existence and regularity, *SIAM J. Appl. Math.* 58, 1278-1306, 1998

5.6. Materiali con memoria

Breuer & Onat, cit. par. 4.3

Graffi, cit. par. 4.3

Staverman A.J., Schwarzl F., Thermodynamics of viscoelastic behaviour, Ver. Akad. Can. Wet. Amsterdam B55, 474-485, 1952

Volterra V., Energia nei fenomeni ereditari, Acta Pontif. Acad. Scient. IV, 115-128, 1940

Capitolo 6

6.1. Il problema dell'equilibrio e il problema di evoluzione per i continui classici, 6.2. Equazioni costitutive e leggi di evoluzione per le variabili di stato, 6.3. Il problema di evoluzione in viscoplasticità perfetta, 6.4. Casi speciali: elastoplasticità perfetta, viscoelasticità, elasticità

de Groot & Mazur 1969, cit. par. 4.1

Del Piero 2009, cit. par. 3.3

Truesdell & Noll 1965, cit. rif. gen.

6.5. Formulazione variazionale dell'elasticità finita

Ball J.M., Convexity conditions and existence theorems in nonlinear elasticity, Arch. Rational Mech. Anal. 63, 337-403, 1977

Ciarlet 1988, cit. rif. gen.

Fichera G., *Existence Theorems in Elasticity*, Handbuch der Physik VIa/2, Springer 1972

6.6. Formulazione variazionale dell'elasticità infinitesima. 6.7. Princípio variazionale per il problema elastico incrementale

Gurtin 1972, cit. rif. gen.

Truesdell & Noll, cit. rif. gen.

6.8. Formulazione variazionale dell'elastoplasticità infinitesima

Hill R., *The Mathematical Theory of Plasticity*, Oxford Univ. Press 1950, paperback 1998

Mielke A., Energetic formulation of multiplicative elasto-plasticity using dissipation distances, Cont. Mech. Thermodyn. 15, 351, 2003

Mielke A., The Evolution of Rate-Independent Systems. In: C. Dafermos, E. Feireisl eds. *Handbook of Differential Equations: Evolutionary Differential Equations*, North-Holland 2005

* * *