

Contents

VOLUME 1. PLENARY TALKS AND HIGH CURRENT APPLICATIONS

Foreword	xxxvii
Acknowledgments	xxxix
Preface	xli
Conference organization	xliii
Eulogy	xlv

Plenary talks

Future prospects of applied superconductivity in Europe*	
<i>H Piel</i>	1
The Appleton Lecture. Large scale application of superconductivity*	
<i>P Komarek</i>	9
Sir James Dewar*	
<i>R J Soulen Jr</i>	23

Oral contributions

Current limiting mechanisms in Bi-Sr-Ca-Cu-O tapes*	
<i>D C Larbalestier, S E Babcock, X Y Cai, S E Dorris, H S Edelmann, A Gurevich, J A Parrell, A Pashitski, M Polak, A Polyanskii, I-Fei Tsu and J-L Wang</i>	29
Superconducting bearings and flywheel batteries for power quality applications*	
<i>T S Luhman, M Strasik, A C Day, D F Garrigus, T D Martin, K E McCrary and H G Ahlstrom</i>	35
Superconducting materials and coils for operation at power frequencies*	
<i>M Polak and M Majoros</i>	41
Industrial impact of the applications of superconductivity in large scale research programs*	
<i>R Penco</i>	47

* Invited

A 1.5 kW HT superconducting synchronous machine*	53
<i>J-T Eriksson, R Mikkonen, J Paasi and L Söderlund</i>	
Microstructure, thermodynamics and critical current densities in Bi,Pb(2223) tapes*	
<i>R Flükiger, G Grasso, B Hensel, M Däumling, A Jeremie, J C Grivel, A Perin, R Gladyshevskii, F Marti and C Opagiste</i>	57
The current state of Maglev development in Japan*	
<i>H Nakashima</i>	61
Centrifugal casting of BSCCO 2212 form parts and their first applications*	
<i>J Bock, S Elschner, P F Herrmann and B Rudolf</i>	67
Fault current limiters based on high temperature superconductors*	
<i>W Paul, J Rhyner, Th Baumann and F Platter</i>	73
Constructing HTS coils for practical applications*	
<i>R G Jenkins and H Jones</i>	79
A reversible rise in the critical current of a Nb ₃ Sn-bronze tape due to a transverse pressure	
<i>B ten Haken, A Godeke and H H J ten Kate</i>	85
Transport critical current measurements in very high pulsed magnetic fields*	
<i>H Jones, C R J Hole, D T Ryan and M van der Burgt</i>	89

Materials processing

80/20 DyBa ₂ Cu ₃ O _{7-x} /Dy ₂ BaCuO ₅ bulk textured materials as a tool for high- J_c superconducting ceramics	
<i>R Cloots, A Rulmont, H Bougrine and M Ausloos</i>	95
Some properties of Tl-1223, prepared in a 'quasi' open system	
<i>Chr L Teske, Hk Müller-Buschbaum, Chr Lang and S Elschner</i>	99
Crystallization of vitreous high- T_c superconducting oxide through laser zone melting method	
<i>M Ausloos, H Bougrine, R Cloots, A Rulmont, A Gilabert and J Y Laval</i>	103
(Bi,Pb)-1212 and (Bi,Pb)-0212, superconducting cuprates with reduced anisotropy	
<i>P Zoller, B Seling, A Bauer, A Ehmann, J Glaser, W Wischert and S Kemmler-Sack</i>	107
Decomposition and reformation of Bi-2212 during the partial melt processing in oxygen	
<i>Th Lang, D Buhl, M Cantoni and L J Gauckler</i>	111

* Invited

Texturing of (2223) superconducting Bi-Pb-Sr-Ca-Cu-O ceramics by different processes using hot pressing and melting in a magnetic field <i>J G Noudem, J Beille, D Bourgault, E Beaugnon, R Tournier, D Chateigner, P Germi and M Pernet</i>	115
Influence of Y_2BaCuO_5 particles on the microstructure of $YBa_2Cu_3O_{7-x}$ - Y_2BaCuO_5 (211) melt-textured superconductors <i>P Diko, W Gawalek, T Habisreuther, T Klupsch and P Görnert</i>	119
Microstructural analysis of the growth front in melt-textured $YBa_2Cu_3O_{7-x}$ (123)- Y_2BaCuO_5 (211) composite <i>P Diko, W Gawalek, T Habisreuther and P Görnert</i>	123
Effect of carbon pollution on the liquid phase stimulating sintering of $YBa_2Cu_3O_{7-x}$ <i>Y B Huang and P G Régnier</i>	127
The microstructure of melt-textured $YBa_2Cu_3O_x/HfO_2$ <i>Y Yan, J E Evetts, J L Zhang and W M Stobbs</i>	131
Texturing of 123 compounds by use of a composite reaction texturing technique <i>B Soylu, J Christiansen, D M Astill, R P Baranowski, J Engel and J E Evetts</i>	135
The growth of large grain YBCO by seeded peritectic solidification <i>Wai Lo and D A Cardwell</i>	139
On the mechanism of melt texturing growth of YBCO bulk samples with $YBa_2Cu_3O_{7-\delta} + nY_2O_3(0 < n < 1.1)$ initial composition <i>M Wu, P Schätzle, W Bieger, K Fischer, W Gawalek, P Görnert, A Köhler, G Krabbes, D Litzkendorf, G Stöver, T Straßer and U Wiesner</i>	143
Optimized melt processing conditions of NdBaCuO materials <i>W Bieger, P Schätzle, G Krabbes, L Zelenina, U Wiesner, G Stöver, P Verges and J Kłosowski</i>	147
Growth of melt-textured $Y_1Ba_2Cu_3O_{7-\delta}$ <i>D Müller, M Ullrich, K Heinemann and H C Freyhardt</i>	151
Enhanced grain growth in melt textured YBCO materials with seeds <i>P Schätzle, W Bieger, G Krabbes, J Kłosowski and G Fuchs</i>	155
Large grains and high performance bulk $YBa_2Cu_3O_x$ superconductors for levitation forces applications <i>X Chaud, E Beaugnon, R Tournier, P Hiebel and E Hotier</i>	159
Unidirectional solidification of $Y_1Ba_2Cu_3O_{7-\delta}$, effect of a magnetic field applied during solidification <i>L Durand, D Dierickx, D Chateigner and P Régnier</i>	163
Numerical simulation of $YBaCuO$ -growth phenomena using the phase field method <i>G J Schmitz, B Nestler, H J Diepers, F Pezzolla, R Prieler, M Seefelberg and I Steinbach</i>	167

Non-equilibrium processing of YBCO <i>G J Schmitz, G Eßber and O Kugeler</i>	171
Influence of precursor preparation on the Y_2BaCuO_5 size distribution throughout melt processed bulk $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ superconductors <i>D Dierickx, K Rosseel, W Boon, V V Moshchalkov, Y Bruynseraeede and O Van der Biest</i>	175
Quenched flake precursors by a special flame fusion process used for the melt texturing of YBCO bulk material <i>M Ueltzen, Ch Seega, H Altenburg, D Litzkendorf, K Fischer, G Bruchlos and P Görnert</i>	179
Growth of large $\text{REBa}_2\text{Cu}_3\text{O}_{7-y}$ and $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8-y}$ crystals <i>K Oka and T Ito</i>	183
Thermal stability of Bi cuprates <i>J Hauck, K Bickmann, S Chernyaev and K Mika</i>	187
YBCO-film formation on ceramic substrates by dip-coating and post-annealing <i>G Risse, K Fischer, B Schlobach and D Schläfer</i>	191
Critical current densities in Bi-2212 thick films <i>D Buhl, Th Lang, M Cantoni and L J Gauckler</i>	195
Enhanced properties in screen printed $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ thick films with additions of platinum and/or $\text{Ba}_4\text{Cu}_{1+x}\text{Pt}_{2-x}\text{O}_{9-z}$ <i>J Langhorn, Y J Bi and J S Abell</i>	199
Melt processing of Bi-2212 thick films and bulk components <i>Th Lang, D Buhl, M Cantoni, Z Wu and L J Gauckler</i>	203
Critical currents	
Transport critical currents in (Y, Gd) $\text{Ba}_2\text{Cu}_3\text{O}_7$ long bars for current lead applications <i>X Granados, V Gomis, S Piñol, M Carrera, B Martínez, F Sandiumenge, N Vilalta, J Fontcuberta, X Obradors, J Iglesias and S Portillo</i>	207
ac loss of high- T_c superconductors in self-field by a contactless method <i>A Díaz, G Domarco, J Maza and F Vidal</i>	211
Preparation, characterization and transport properties of epitaxial $\text{YBa}_2\text{Cu}_3\text{O}_7/\text{REBa}_2\text{Cu}_3\text{O}_7$ superlattices <i>A Schattke, Th Becherer, S Eckert, G Jakob and H Adrian</i>	215
The supercurrent transport and structure of grain boundaries in the $\text{Bi}_2\text{Sr}_2\text{Ca}_{n-1}\text{Cu}_n\text{O}_x$ system <i>Y Yan, J E Evetts, B Soylu and W M Stobbs</i>	219

Fishtail effect and current-voltage characteristics of high- T_c superconductors <i>K I Kugel, T Matsushita, E Z Meilikov and A L Rakhmanov</i>	223
Proton doped layers in YBCO bulk <i>S Colombo, R Gerbaldo, G Ghigo, L Gozzelino, E Mezzetti and B Minetti</i>	227
Dissipation processes in transport-current-carrying $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10+\delta}$ and $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ thin films <i>L Miu, U Frey, F Hillmer, D Miu, G Wirth and H Adrian</i>	231
Relaxation measurements in a $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ single crystal with inhomogeneous pinning <i>M R Koblischka, A J J van Dalen, H Kuhn, Th Schuster and M Konczykowski</i>	235
Flux creep measurements on a melt-textured YBCO sample <i>J Lorenz, M Reissner, W Steiner, P Diko, N Pellerin and P Odier</i>	239
Short time flux creep in $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10}$ tapes <i>A Gupta, E D Tuset, M G Karkut and K Fossheim</i>	243
The critical current densities of some Tl-based superconductors: influence of the various atomic compositions <i>A Kilic, S Senoussi, H Traxler, J C Moore, A J Collier, M J Goringe and C R M Grovenor</i>	247
Transport critical current measurements of a HIP'ed and unHIP'ed bulk samples of PbMo_6S_8 in magnetic fields up to 12 Tesla <i>H A Hamid, D N Zheng and D P Hampshire</i>	251
Critical currents of the Chevrel phase $\text{Pb}_{1-x}\text{Gd}_x\text{Mo}_6\text{S}_8$ <i>D N Zheng and D P Hampshire</i>	255
Critical current densities, scaling relations and flux pinning in NbTi as determined by flux penetration measurements <i>H D Ramsbottom and D P Hampshire</i>	259
The abnormal temperature dependence of j_c in YBCO textured high- T_c superconductors <i>L M Fisher, A V Kalinov, J Mirkovic, V M Soukhov and I F Voloshin</i>	263
Influence of point-like defects on the melting transition in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ single crystals <i>W Jahn, S N Gordeev, A A Zhukov, H Küpfer and T Wolf</i>	267
Pinning mechanisms in melt textured $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ - Y_2BaCuO_5 ceramics <i>B Martínez, X Obradors, A Gou, V Gomis, S Piñol, J Fontcuberta and H Van Tol</i>	271
Twin boundaries induced transformations of vortex pinning and flux creep in $\text{YBa}_2\text{Cu}_3\text{O}_y$ single crystals <i>A A Zhukov, H Küpfer, M Kläser, H Claus and H Wühl</i>	275

Strong pinning in melt-textured $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ with non-superconducting Y_2BaCuO_5 inclusions <i>K Rosseel, D Dierickx, J Lapin, V V Metlushko, W Boon, L Trappeniers, J Vanacken, F Herlach, V V Moshchalkov, Y Bruynseraede, O Van der Biest, L Reylandt and F Delannay</i>	279
Flux pinning in Bi-2212 single crystals with various oxygen concentrations and with Ti doping <i>T W Li, P H Kes, A A Menovsky and J J M Franse</i>	283
Direct correlation between TEM studies and pinning lengthscales for columnar defects in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ thin films <i>W S Seow, R A Doyle, Y Yan, D Kumar, J D Johnson, A M Campbell, P Berghuis, R E Somekh, J E Evetts, G Wirth and J Wiesner</i>	287
'Arrowhead' magnetization anomaly, hysteresis loop scaling properties and the irreversibility line in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ <i>C D Dewhurst, R A Doyle, D A Cardwell, A M Campbell and G Balakrishnan</i>	291
Critical currents and vortex-glass melting in $\text{YBa}_2\text{Cu}_3\text{O}_7$ microstrips probed by phase-sensitive ac impedance measurements <i>W Lang, C Fussenegger, S Proyer, E Stangl and D Bäuerle</i>	295
Experimental and analytical study of pinning mechanisms in high-temperature superconductors <i>C Attanasio, C Coccorese, V N Kushnir, L Maritato, S L Prischepa and M Salvato</i>	299
Anisotropy of critical current density, volume pinning force, and flux dynamics in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ single crystals <i>V M Pan, V F Solovjov and H C Freyhardt</i>	303
Magnetization vector rotation in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_{4-y}$ single crystals with various Sr doping and different anisotropy factors <i>Yu V Bugoslavsky, K V Gamayunov, A L Ivanov, V A Kovalsky and A A Minakov</i>	307
The peak-effect in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ single crystals with different oxygen stoichiometry <i>A A Zhukov, H Küpfer, G Perkins, L J Cohen, A D Caplin, S A Klestov, H Claus, V I Voronkova, T Wolf, M Kläser and H Wühl</i>	311
Field dependence of current density in strong pinning YBCO single crystals with different microstructure <i>R Hiergeist, R Hergt and A Erb</i>	315
Comparative study of anisotropy of the critical current density in YBCO melt textured samples and single crystals <i>L M Fisher, A V Kalinov, J Mirkovic, I F Voloshin, A V Bondarenko, M A Obolenskii and R L Snyder</i>	319
Trapped magnetic flux density in the Bi-2223 superconducting tubes <i>V Plecháček and J Hejtmánek</i>	323

ac susceptibility crossovers in composite (CuO/YBa₂(Cu_{1-x}Fe_x)₃O_{7-δ}

M Mehbod, J Schroeder, I Grandjean and M Ausloos

327

Conductor fabrication and properties

Characterization of the partial melt processing of Bi-2212

C G Morgan, M Priestnall, N C Hyatt and C R M Grovenor

331

A novel continuous process for the production of long lengths of BSCCO-2212/Ag dip-coated tape

J W Burgoyne, C J Eastell, C G Morgan, D East, R G Jenkins, R Storey, M Yang, D Dew-Hughes, H Jones, C R M Grovenor and M J Goringe

335

Highly textured tapes prepared by sequential electrolytic deposition

F Legendre, L Schmirgeld-Mignot, P Régnier, Ph Gendre and S Séroussi

339

The effect of lubrication on sequentially pressed long lengths of BSCCO-2223 powder in tube tape

M P James, S P Ashworth, B A Glowacki, R Garré and S Conti

343

Silver clad Bi-2212 tape for low temperature high field applications

M Ionescu, S X Dou, E Babic, I Kusevic, M Apperley and E W Collings

347

Novel processing of Bi-based high- T_c superconducting monofilamentary and multifilamentary wires and tapes

Y C Guo, P A Bain, H K Liu, S X Dou, E W Collings and G Secrett

351

Influence of superconducting layer thickness on the dissipation in monofilamentary BSCCO/Ag 2223 tapes

J Everett, M D Johnston, M Dhallé, H K Liu, S X Dou and A A Caplin

355

Status of development of HTS tapes for different applications

G Papst, J Kellers and A P Malozemoff

359

Processing and properties of 2223 BiPbSrCaCuO/Ag tapes

K Fischer, U Schläfer, Ch Rodig, M Schubert, W Häßler, B Roas, H-W Neumüller, A Jenoveliš and B Wolf

363

Ceramic core density and transport current density of Bi(2223)/Ag superconductors

P Kováč, I Hušek and W Pachla

367

Analysis of inhomogeneities in thermomechanically processed long length Ag/BSCCO tapes

F Lera, A Villegas, A Badía, E Martínez, G F de la Fuente, A Larrea and R Navarro

371

Effects of sintering parameters on the superconducting properties of Ag-sheathed Bi(Pb)2223 tapes

A Baldini, E Borghi, S Conti, R Garré, L Masi and A Peruzzi

375

Transverse inhomogeneities of Pb/BSCCO 2223 tapes from the core-sheath interface to the centre of the core <i>Z Yi, L Law, S Fisher, C Beduz, Y Yang, R G Scurlock and R Riddle</i>	379
Effects of the time sequence of cold working on critical current densities of Ag-alloy sheathed BiPb2223 tapes <i>M Penny, C Beduz, Y Yang, M Al-Mosawi, R Scurlock and R Wroe</i>	383
The effect of heating rate on the 2223 phase formation and core morphology of (Pb,Bi)2223 superconducting tapes <i>D M Spiller, M K Al-Mosawi, Y Yang, C Beduz and R Riddle</i>	387
Densification and texturing of long Bi,Pb(2223) bars by hot rolling <i>A Perin, E Walker and R Flükiger</i>	391
Enhancement of j_c in long monofilamentary Bi(2223) Ag-sheathed tapes by optimization of the fabrication process <i>G Grasso, F Marti, A Jeremie, A Perin, B Hensel and R Flükiger</i>	395
Alternative methods for the fabrication of Bi,Pb(2223) silver sheathed tapes <i>A Jeremie, G Grasso and R Flükiger</i>	399
Formation and superconducting properties of the $(\text{Bi}, \text{Pb})_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-y}$ phase in bulk samples with oxide additions and in alloyed Ag-sheathed tapes <i>J-C Grivel, G Grasso, A Perin and R Flükiger</i>	403
Texture formation in silver-sheathed bismuth-based superconducting tapes <i>J Jiang and J S Abell</i>	407
Current-voltage characteristics of BSCCO-2212 wires and BSCCO-2223 tapes <i>B Lehndorff, B Fischer, M Hortig, R Theisejans and H Piel</i>	411
Non-invasive Hall probe measurements of the lateral current distribution in BSCCO/Ag conductors <i>M D Johnston, J Everett, M Dhallé, G Grasso, R Flükiger, M Yang, C R M Grovenor and A D Caplin</i>	415
Limits on the critical current of BSCCO/Ag conductors <i>M Dhallé, M N Cuthbert, J Thomas, J Everett, M D Johnston, H K Liu, S X Dou, G Grasso, R Flükiger, J Kessler, W Goldacker, M Yang, C Grovenor and A D Caplin</i>	419
Low field magnetization non-destructive evaluation of HTS tapes within the Bean critical state model <i>K L Telschow, L S Koo and K K Haulenbeek</i>	423
Current-voltage characteristics of $\text{Bi}_2\text{Sr}_2\text{Ca}\text{Cu}_2\text{O}_x$ tapes with and without Ag sheath <i>M Polak, W Zhang, E Hellstrom and D C Larbalestier</i>	427

A study of current transfer at 77 K in a high current (Bi _{2-x} , Pb _x)Sr ₂ Ca ₂ Cu ₃ O _{10-δ} /silver composite conductor <i>C M Friend, I Ferguson, I W Kay, L Le Lay, M Mölgg, C Groombridge and T Beales</i>	431
<i>J_c</i> vs strain performance of Ag/Bi-2223 tapes with different geometrical structures <i>L Martini, L Bigoni, E Varesi, S Zannella, L Gherardi, P Caracino and S Spreafico</i>	435
Critical current and hysteretic ac loss in monofilamentary Bi-2223/Ag tapes <i>K-H Müller, C Andrikidis, H K Liu and S X Dou</i>	439
Flux creep and weak link behaviour in silver sheathed Bi-2223 tapes <i>G Fuchs, T Staiger, P Verges, K Fischer and Å Gladun</i>	443
Spatial and temporal temperature and voltage signals of a silver-sheathed BSCCO tape undergoing a quench: experimental and analytical results <i>Y Iwasa and M I Yunus</i>	447
Effects of deformation radius during rolling on the properties of Bi-2223/Ag superconductor tapes <i>D W A Willén, C Breau, W Zhu, D Asselin, R Nadi and J R Cave</i>	451
IV measurements and scaling analyses of Ag/Bi2223 tapes <i>M G Karkut, J O Fossum, P Tuset, Wu Ting and K Fosheim</i>	455
The ‘railway-switch’ model for (Bi, Pb) ₂ Sr ₂ Ca ₂ Cu ₃ O ₁₀ silver-sheathed tapes—limitations for the critical transport current by the low intragrain critical current density <i>j_c</i> ^c along the <i>c</i> -axis <i>B Hensel, G Grasso, D P Grindatto, H-U Nissen and R Flükiger</i>	459
Lateral distribution of the transport critical current density in Bi(2223) Ag-sheathed tapes <i>G Grasso, B Hensel, A Jeremie and R Flükiger</i>	463
Structural development in Bi(2223)/Ag tapes made by press-sinter procedure <i>W Pachla, P Kováč, H Marciniak and I Hušek</i>	467
Critical currents and microstructure of Tl-1223 high-temperature-superconductor bulk samples and tapes <i>W Mexner, S Heede, J Hoffmann, K Heinemann and H C Freyhardt</i>	471
Critical current anisotropy of Ag sheathed 2212 Tl-Ba-Ca-Cu-O superconducting tapes <i>F Chovanec, L Janšák, P Kottmann, M Majoroš, P Ušák, D Suchoň and M Jergel</i>	475
Preparation and physical characterization of Tl(1223) tapes with <i>j_c</i> (77 K 0 T) > 10 kA/cm ² <i>R E Gladyshevskii, A Perin, B Hensel and R Flükiger</i>	479
Study of Tl-1223 for use in wire and tape fabrication <i>J C Moore, S Fox, C J Salter, A Q He and C R M Grovenor</i>	483

Influence of sheath material and thermal/mechanical processing on critical current densities in thallium-based superconducting tape <i>S Fox, J C Moore and C R M Grovenor</i>	487
Preparation and characterization of $Tl_2Ba_2Ca_2Cu_3O_y$ superconducting tapes <i>M K Al-Mosawi, D M Spiller, C Beduz, Y Yang and D M Ogborne</i>	491
Effect of thermal cycling on wound HTS conductors <i>D K Hilton, D K Hamilton, J W Howton and Y S Hascicek</i>	495
Growth of HTSC films with high critical currents on polycrystalline technical substrates <i>A I Usoskin, H C Freyhardt, F García-Moreno, S Sievers, O Popova, K Heinemann, J Hoffmann, J Wiesmann and A Isaev</i>	499
Biaxially textured YSZ and CeO_2 buffer layers on technical substrates for large-current HTS-applications <i>J Wiesmann, J Hoffmann, A Usoskin, F García-Moreno, K Heinemann and H C Freyhardt</i>	503
Improvement on J_c transport of the quaternary $Pb_{0.6}Sn_{0.4}Mo_6S_8$ Chevrel phase wire <i>N Cheggour, A Gupta, M Decroux, J A A J Perenboom, P Langlois, H Massat, R Flükiger and Ø Fischer</i>	507
Bulk material and conductor properties	
Inhomogeneities of fine-filamentary ac superconductors <i>M Majoroš, D Suchoň and M Polák</i>	511
Temperature effects on Nb-Ti strands extracted from coextruded Al stabilized cables <i>R Garré, S Conti, A Baldini, S Rossi and P Ricotti</i>	515
Quench propagation in cabled superconductor: the effect of the current redistribution among strands <i>N A Buznikov, A A Pukhov, A L Rakhmanov and V S Vysotsky</i>	519
Minimum propagation current in composites with small contact electrical resistance, the model with current sharing <i>A A Akhmetov, K Kuroda and M Takeo</i>	523
Decay of long current loops in the superconducting cables <i>A A Akhmetov, K Kuroda, T Koga, K Ono and M Takeo</i>	527
In-situ TEM observation of the decomposition of Y-124 into Y-123 and CuO <i>M Reder, D Müller, K Heinemann and H C Freyhardt</i>	531
Relaxation measurements of VGF melt-textured $YBa_2Cu_3O_{7-\delta}$ with varying stoichiometry <i>J Krelaus, M Ullrich, K Heinemann and H C Freyhardt</i>	535

Screening properties of Bi-2212 superconducting tubes <i>J R Cave, D R Watson and J E Evetts</i>	539
Physical and mechanical characterization of YBCO samples obtained by new TLDMG process <i>F Abbattista, R Albanese, M Vallino, R Gerbaldo, G Ghigo, L Gozzelino, E Mezzetti, B Minetti and A B Mossolov</i>	543
Investigating the characteristics of high-temperature superconductors by means of MMMA <i>B Andrzejewski, B Czyżak, J Stankowski and L Kevan</i>	547
Surface degradation of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ powders studied by XPS and ac susceptibility <i>I Sargánková, P Diko, J D Tweed, C A Anderson and N M D Brown</i>	551
The field and temperature dependencies of the intra-grain and inter-grain critical current densities in $(\text{Tl}_{0.5}\text{Pb}_{0.5})(\text{Sr}_{0.8}\text{Ba}_{0.2})_2\text{Ca}_2\text{Cu}_3\text{O}_x$ ceramics <i>S Senoussi, A Kilic, S K Wivel and C R M Grovenor</i>	555
The effect of twin planes in the pinning mechanism of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ single crystals <i>K Deligiannis, M Oussena, P A J de Groot, A V Volkozub, R Gagnon and L Taillefer</i>	559
Synthesis of Bi-Pb-Sr-Ca-Cu-O superconducting fiber by using sodium alginate <i>A Takada, T Shimuzu, L Shimono and H Konishi</i>	563
Microwave properties of bulk polycrystalline YBCO <i>B A Tonkin and Y G Prokova</i>	567
Frequency dependence of ac susceptibility in YBCO sintered samples <i>M Polichetti, I D'Acunto, S Pace, L Reggiani, A M Testa and D Di Gioacchino</i>	571
Neutron irradiation effects on critical current densities in Tl-1223 and Tl-2223 superconductors <i>G Brandstätter, X Yang, F M Sauerzopf and H W Weber</i>	575
Flux visualization as sensitive tool to investigate defect structures in superconductors <i>M R Koblischka</i>	579
Specific heat of PbMo_6S_8 and $(\text{Pb}_{0.7}\text{Gd}_{0.3})\text{Mo}_6\text{S}_8$ superconductors in high magnetic fields <i>S Ali, H D Ramsbottom, D N Zheng and D P Hampshire</i>	583
Thermal conductivity (and thermoelectric power) of neutron irradiated Bi-based high critical temperature superconductors <i>M Pekala, H Bougrine and M Ausloos</i>	587
Inhomogeneous distribution of the surface electric field on PbBi2223 tapes: implications for the measurement of total ac losses <i>Y Yang, T Hughes, D M Spiller, C Beduz, M Penny and R G Scurlock</i>	591

ac losses of 2223 BPSCCO Ag-sheathed tapes and cables <i>J Wiezoreck, M Leghissa, G Ries, H-W Neumüller and M Lindmayer</i>	595
Critical currents and transport ac losses in tube-in-tube Ag/Bi-2223 tapes <i>M Ciszek, M P James, B A Glowacki, S P Ashworth, A M Campbell, R Garré and S Conti</i>	599

Large scale and industrial applications

Inductive superconducting current limiter: state of art and prospects <i>V Meerovich, V Sokolovsky, G Jung and S Goren</i>	603
HTSC switch controlled by magnetic field <i>V Meerovich, V Sokolovsky, W Gawalek and P Görnert</i>	607
Preparation of superconducting YBCO films on polycrystalline YSZ-substrates by single-source MOCVD <i>L Klippe and G Wahl</i>	611
Current limiters using high temperature superconducting wire: applications and realization concepts <i>M Kleimaier and C Russo</i>	615
Current limiting properties of superconducting YBCO films <i>R Wördenebeber, U Krüger, J Schneider, R Kutzner and G Ockenfuss</i>	619
Inductive HTS fault current limiter development <i>J R Cave, D W A Willén, R Nadi, W Zhu and Y Brissette</i>	623
Design of a superconducting high β linac <i>H Heinrichs, H Piel and R W Röth</i>	627
Preparation of YBCO thick films by pulsed laser deposition for a superconducting fault current limiter <i>W Schmidt, P Kummeth, P Schneider, B Seebacher and H-W Neumüller</i>	631
Development of resistive HTSC fault current limiters <i>G Ries, B Gromoll, H W Neumüller, W Schmidt, H P Krämer and S Fischer</i>	635
Transient analysis of the HTSC current limiter <i>H Castro and L Rinderer</i>	639
Possible applications of cryoalternators in ship propulsion systems <i>I A Glebov and L I Chubraeva</i>	643
Modelling high frequency superconducting converters <i>O A Shevchenko, H H J ten Kate and M A Fedorovsky</i>	647
On-board linear generator for EDS-MAGLEV vehicles: design optimization of the SC and induction windings <i>M Andriollo, G Martinelli, A Morini and A Scuttari</i>	651

Experimental investigation of cryogenic motor model <i>L I Chubraeva, S N Pylinina, V E Sigaev and V A Tutaev</i>	655
Superconducting variable speed motor <i>P Tixador, H Daffix and F Simon</i>	659
Stability of superconductive turbogenerators with slow-response excitation <i>I A Glebov and L I Chubraeva</i>	663
A versatile and plain thermal equivalent circuit for the rotor of a superconducting synchronous generator <i>H Köfler</i>	667
An active superconducting magnetic bearing <i>T A Coombs and A M Campbell</i>	671
Magnet configurations for superconducting bearings <i>P Tixador, P Hiebel, E Hotier, X Chaud, R Tournier and E Beaugnon</i>	675
Directional solidification of YBCO cylinders for magnetic levitation applications <i>J Mora, X Granados, V Gomis, M Carrera, F Sandiumenge, S Piñol, J Fontcuberta and X Obradors</i>	679
Properties of a superconducting magnetic bearing <i>P Stoye, G Fuchs, W Gawalek, P Görnert and A Gladun</i>	683
Bulk melt textured YBCO for electrical hysteresis machines and levitated linear guidance systems <i>T Straßer, T Habisreuther, W Gawalek, M Wu, D Litzkendorf, P Görnert, K V Iljushin and L J Kovaljov</i>	687
A comparative study of levitation force and magnetic stiffness of bulk YBCO and YBCO thin films <i>B Lehndorff, H-G Kürschner and B Lücke</i>	691
Magnetic shielding effects of high- T_c superconducting cylinder by using an amorphous-metal cylinder <i>M Itoh, K Mori, T Minemoto, F Pavese, M Vanolo, D Giraudi and Y Hoita</i>	695
Method of vibration damping based on ac losses in bulk high- T_c superconductors <i>L S Fleishman, Yu A Bashkirov, V A Malginov, O L Poluschenko and N A Nizhelskii</i>	699
Dynamic characteristics of iron-cored magnets using high- T_c superconductors <i>A A El-Abbar, R M Goodall, C J MacLeod, A M Campbell, R G Jenkins and H Jones</i>	703
4.8T cryogen free NbTi magnet, operated at 5 K with high- T_c BiSrCaCuO (2212) current leads <i>L Cowey, K Timms, M Biltcliffe and P Cetnik</i>	707
Use of SMES for compensation of system perturbations <i>E Handschin, A Altmann, M Schroeder, Th Stephanblome and A Tromm</i>	711

Critical current of a Bi-2223/Ag pancake coil <i>M Lahtinen, J Paasi and Z Han</i>	715
Development of Bi-2212/Ag multilayer structures and monolithic pancake coils prepared by tape casting, elastomer processing and composite reaction texturing <i>M Chen, D R Watson, A J Misson, B Soylu, B A Glowacki and J E Evetts</i>	719
Preparation of zone melted YBCO-rods with high current contacts <i>C Gross, S Elschner and W Assmus</i>	723
An ac superconducting Nb ₃ Sn coil for use in high magnetic fields <i>H D Ramsbottom, D P Hampshire, H Jones and D B Smathers</i>	727