Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

**Planar faults in metastably retained hexagonal $BaTiO_3$.** YU-CHUAN WU, HONG-YANG LU — Hot-pressed $BaTiO_3$ ceramic samples contain predominantly h-$BaTiO_3$ as determined by XRD, and with a trace amount of t-$BaTiO_3$ as revealed by TEM. Extended planar stacking faults (EPSF's) found ubiquitously in hot-pressed samples having the eligible fault vectors $\boldsymbol{R}_{F(I)} = (1/2)\mathbf{c} + \mathbf{p}_{(I)}$ and $\boldsymbol{R}_{F(II)} = (\mathrm{n}/6)\mathbf{c} + \mathbf{p}'_{(II)}$, containing both $\mathbf{p}_{(I)} = 1/3\langle 2\underline{1}\underline{1}0\rangle$, $\mathbf{p}'_{(II)} = 1/3\langle 10\underline{1}0\rangle$, n = 1, 2, 4, and 5, and $\mathbf{c}$ = [0001], have been determined by contrast analysis using the $2\pi \boldsymbol{g}\cdot\boldsymbol{R}_F = 0$ or $2\mathrm{n}\pi$ criteria crystallographically, and the number of layers along $\boldsymbol{c}$ confirmed by high-resolution imaging uniquely. Two general types of EPSF's are found; one group with only three vectors of the six degeneracies of the **p**-component $\langle 10\underline{1}0\rangle$ eligible and the other with all six degeneracies of the **p**-component $\langle 2\underline{1}\underline{1}0\rangle$ eligible for the fault vector. The latter is analogously a $\pi$-rotation fault (as in $DO_{19}$ intermetallics) that a rotation about [0001] by $180^o$ (or $60^o$) arrives at another eligible fault vector. The metastable retention of the high-temperature h-$BaTiO_3$ phase is discussed in favour of oxygen deficiency.

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Date submitted: 29 Nov 2005 Electronic form version 1.4