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Pulsed versus d.c. I-V characteristics of charge-ordered LuFe₂O₄
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MICHAEL REISNER, Physics Department, Technion, Haifa — We report on elec-
tronic transport measurements in a polycrystalline sample of LuFe₂O₄, over a wide
range of electric fields and at temperatures above 230 K , - the range of tempera-
tures was limited by the high resistivity of the sample . This work was motivated by
reports about striking non-linear conductivity in polycrystals and single crystals of
this multiferroic, in relatively moderate electric fields. Using short (\sim msec) single
current pulses four probe measurements detected no deviations from linearity in the
I-V characteristics, in fields up to $E \approx 500$ V/cm. However, strong non-linearity and
hysteresis were found in d.c. measurements at fields that decreased with increasing
temperatures, suggesting self-heating. We include a set of oscillograms showing the
time dependence of the voltages between the various probes at fixed current and
temperature, which emphasize the importance of time domain studies of non-linear
conductivity effects. We gratefully acknowledge Prof. Young Sun from the Institute
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