message from Detlef Reschke, DESY

- **no proven model, simulations or measurements for phase change and the variations with time in the cavity**
- **during the next RF tests of our 1.3-GHz cavities I will try some measurements w.r.t. to this and time needed for a quench**
- I remember there have been time dependent calculations of the quench itself in the **late 1990's by Tom Hays** in Cornell, but this was not related to any phase changes inside the cavity
- 1) the **fastest detection of the quench is the sudden decrease of the transmitted power within in few milliseconds**; the transmitted power (P_t) gives directly the gradient in the cavity: E_{acc} = const. * sqrt(P_t): **if P_t decreases at constant forward power by more than the usual fluctuations this clearly indicates a quench** (or sudden additional losses).
- **within the timescale of about 100µsec one can trigger the beam dump**; details are up to the *low level RF* and *beam inhibit* colleagues
- in principle the same arguments are valid for the reflected power, but here you have to handle much higher power levels and more effects of the beam
- **about a phase change of 90 degree inside the cavity I have no idea**
- all other quench detections are detections of secondary effects and slower than 1)

reported by Frank Zimmermann