VII. SUMMARY

In summary a main effort of this working group was to study how one can learn something about electroweak symmetry breaking at machines like LHC. The main result is that a ρ-like object as expected in QCD-like or Technicolor scenarios can be seen in the $W^{\pm}Z$ channel via leptonic decays if it has a mass up to $O(2\ TeV)$. The luminosity will determine the highest reachable mass. With $\mathcal{L} = 10^{34}\ cm^{-2}s^{-1}$ LHC should be able to detect such a state below 2 TeV where good lepton detection capabilities are assumed. If this ρ-like object is however heavier then more luminosity will be essential. To surpass 2 TeV and maybe even reach 2.5 TeV the full luminosity of 4.0 $10^{34}cm^{-2}s^{-1}$ is required. Both simulation methods (see section II and III) give comparable consistent results. The dominance of the contributions from qq' annihilation via mixing for masses $m_\rho < 2\ TeV$ particularly at LHC parameters was nicely emphasized by the BESS group and also included in the DHT approach.

The DHT approach allows to simulate more general dynamical cases such as Higgs-like dynamics for which the ZZ channel is most promising. The signal to background ratio is however not as good as in the QCD/Technicolor case. Correspondingly the limits on a Higgs like state will be weaker. For a Higgs particle a lower limit up to about 800 GeV (see Higgs group) will arise. Since consistency requirements limit the Standard Model Higgs to values below this limit it will be possible to cover the full window of allowed masses of the Standard Model. If no Higgs is found then the normal (simplest) Higgs scenario is ruled out and alternatives must be sought. In this context it is important that the search for ρ-like objects will be possible up to 2 or 2.5 TeV which is precisely the range where scaled QCD or Technicolor would predict it to be. Therefore the LHC can fully cover the two simplest scenarios of symmetry breaking. Note that the limits for a scalar or ρ-like object are a direct consequence of its mass and the underlying mass to width relations. Therefore any nonstandard width can make the corresponing signal more or less visible. If the widths are for whatever reason wider than normal then the limits get weaker.

Comparing the LHC and SSC one finds roughly the same physics potential. With the chosen parameters both machines are good at finding a ρ-like state in the $W^{\pm}Z$ channel up to masses $O(2\ TeV)$. The signal to background ratio is typically slightly better for the SSC but with a smaller number of events. The ability to reach the design parameters and to build such demanding detectors will therefore decide which machine is better.

The LHC will be able to put very strong limits on the scale of compositeness. Typically these limits are $\sim 20\ TeV$. Excited leptons and quarks can be limited to be heavier than $5 - 10\ TeV$.

Consequences of baryon number violating processes have been described in section VI. Some of the ingredients involved are still disputed and are hopefully fully clarified within the next years. If this mechanism is relevant and if the threshold energy is below 11 TeV then this will be important at LHC any may be one out of many new things that could show up when we make such a big step forward towards higher energies.