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WARM LIQUID CALORIMETRY FOR LHC

E. Geulig, T. Lehmann, W. Wallraff

I. Physikalisches Institut der RWTH Aachen, Germany

A. Bezaguet, F. Cavanna, P. Cennini, S. Cittolin, P. Dreesen, M. Demoulin,

L. Dumps, A. Fucci, G. Gallay, A. Givernaud, A. Gonidec, W. Jank,

G. Maurin*, A. Placci, J.P. Porte, E. Radermacher, D. Samyn,

D. Schinzel, W.F. Schmidt**, B.G. Taylor

CERN, Geneva, Switzerland

E. Pietarinen

Department of HEP, University of Helsinki, Finland

P. Casoli, S. Centro, F. Dal Corso

Dipartimento di Fisica dell'Università e Sezione INFN di Padova, Italy

P. Carlson, W. Klamra, Th. Lindblad, B. Lund-Jensen,

Manne Siegbahn Institute of Physics, Stockholm, Sweden

* *Contact person*

** *Hahn-Meitner Institut, Berlin*

Summary

Recent results from the beam tests of the U/TMP "**warm liquid**" calorimeter, constructed by the UA1 Collaboration, show that such a technique is very promising for LHC. Our aim is to extend this programme and design a calorimeter that can satisfy the requirements of high rates, high radiation levels, compensation, uniformity and granularity, as well as fully contain hadronic showers.

We propose to construct liquid ionization chambers operated at very high fields capable to collect the total charge produced by the passage of ionizing particles within times comparable to the bunch crossing time of the future Collider. For this reason we plan to extend the current programme on tetramethylpentane (TMP) to tetramethylsilane (TMSi). Our programme includes irradiation tests of both room temperature liquids to investigate their behaviour as far as pressure increase, electron mobility and electron lifetime is concerned.

As a first step an electromagnetic calorimeter consisting of very high field ionization chambers filled with TMSi as sensitive medium with Uranium and/or other high density material as absorber will be built, on which newly designed fast amplifiers and read out electronics will be tested. In a second step a full scale calorimeter module will be constructed.

In addition, as already agreed for the completion of the UA1 U/TMP activity, a fully assembled supergondola will be installed in ECA 5 in order to test noise and cross-talk in real environment. Cosmic ray runs will allow to control calibration and stability under several conditions over a long period of time.