β-Spektrums mit Hilfe eines elektrostatischen Gegenfeldspektrometers vom Typ MAC-E-Filter vermessen. Um die angestrebte Sensitivität des Experiments zu erreichen, muss die Retardierungsspannung des MAC-E-Filters von −18, 6kV mit einer maximalen Unsicherheit von 3ppm überwacht werden. Zu diesem Zweck wurden in Zusammenarbeit mit der PTB (Physikalisch Technische Bundesanstalt) Braunschweig zwei hochpräzise Spannungsteiler entwickelt, die die benötigte Präzision erreichen.

Der zweite Spannungsteiler für Spannungen bis 65kV stellt eine Weiterentwicklung gegenüber dem ersten Spannungsteiler dar. In diesem Vortrag werden der Aufbau und die Eigenschaften der beiden Spannungsteiler dargestellt. Weiterhin werden Kalibrierungen an der PTB und Anwendungsmöglichkeiten über das KATRIN-Experiment hinaus (z.B. das BeTINa-Experiment am CERN) aufgezeigt. Dieses Projekt wird durch das BMBF gefördert unter dem Kennzeichen 05A08PM1.

HK 69.7 Fr 15:30 HG ÜR 5

Untersuchung der Transmissionseigenschaften des KATRIN-Vorspektrometers — •Matthias Prall[1], Lutz Bornschein[2], Florian Fraenkle[2], Stefan Goerhardt[2] und Christian Weinheimer[1] für die KATRIN-Kollaboration — [1]Institut für Kernphysik, Universität Münster — [2]KIT Karlsruhe

Das **KA**rlsruhe **TRI**tium **N**eutrino Experiment, **KATRIN** wird die effektive Masse des $\overline{\nu}_e$ mit einer Sensitivität von 0.2 eV (90% C.L.) durch eine Vermessung der Form des β-Spektrums von T_2 am Endpunkt bei 18.6 keV bestimmen. Zu diesem Zweck sind zwei Spektrometer, ein Vor- und ein Hauptspektrometer vom MAC-E Filter Typ hintereinandergeschaltet. Die Aufgabe des Vorspektrometers ist eine Reduktion des Flusses von β-Elektronen in das Hauptspektrometer, wodurch der Untergrund des Experimentes reduziert wird. Durch die Kombination der beiden Spektrometer erzeugt man aber auch eine Penning-Falle für Elektronen zwischen den Spektrometern, was den Untergrund durch Restgasionisation wiederum erhöhen könnte. In Testmessungen wurde untersucht, wie sich eine Reduktion der Retardierungsspannung, die eine weniger ausgeprägte Falle ermöglichen würde, auf die Transmissionseigenschaften des Vorspektrometers auswirkt. Dieses Projekt wird vom BMBF unterstützt (Projektnummer 05A08PM1).

HK 69.8 Fr 15:45 HG ÜR 5

Development of a low neutron emission ^{228}Th source for the calibration of GERDA — •Michal Tarka for the GERDA-Collaboration — Universitaet Zuerich

GERDA (GERmanium Detector Array) is a very-low background experiment under construction at LNGS (Laboratori Nazionali del Gran Sasso, 3400 m.w.e.) in Italy. It is designed to search for the neutrinoless double-β decay using an array of enriched ^{76}Ge detectors. A limit of $T_{1/2}$=15·10^{25} y in Phase II of GERDA can be achieved by limiting the background rate to B $\leq$ 1·10^{-3} cts/(keV·kg·y). This requires a good understanding and suppression of the background produced by cosmic rays and natural radioactivity. Furthermore neutrons from spontaneous fission and (α,n) reactions in adjacent materials can contribute considerably to the background rate. ^{228}Th has been established as a good calibration source candidate for GERDA due to its γ-emission in the region of interest around $Q_{\beta\beta}$ = 2.04 MeV. The calibration setup requires that the ^{228}Th source is permanently installed in the setup during data taking in a parking position at 3.5 m above the germanium detector array. Monte Carlo simulations have shown that the γ-background from the calibration source located in its parking position can be suppressed by a Ta absorber. This work investigates the significance of the neutron background induced by (α,n) reactions within the intrinsic components of a commercialy available ^{228}Th calibration source. Furthermore a new type of a ^{228}Th source has been developed in order to reduce the n-rate approximately by two orders of magnitude compared to a commercial ^{228}Th source.

HK 70: Instrumentierung XIV

Zeit: Freitag 14:00–16:00 Raum: HG ÜR 6

HK 70.1 Fr 14:00 HG ÜR 6

Scheduling of Virtualized Machines for ALICE HLT — Stefan Boettger[1], Udo Kebschull[1], and •Volker Lindenstruth[2] for the ALICE-HLT-Collaboration — [1]Kirchhoff-Institut für Physik, Heidelberg — [2]Frankfurt Institute for Advanced Studies

For the ALICE experiment at CERN a computing farm (ALICE HLT) is used for on-line processing of events. There are phases where no or few data is available for processing, leaving the computing power of this special-purpose cluster unused. Our goal is to make these computing resources available to 3rd party physics applications whenever possible, thereby making the HLT a general-purpose cluster. To achieve this goal the resource constraints of the on-line event processing have to be satisfied and a provisioning scheme of unused resources to 3rd party applications is needed. OS-virtualization has been evaluated and found to be an enabling technology for this aim. Common scheduling algorithms have been studied and turn out to be insuffiencient in providing the flexibility needed in an on-line environment. We therefore propose a scheduling solution for virtual machines which extends job-scheduling algorithms with the preemption and migration features offered by virtualization. To comply with the on-line processing requirements a policy-based capacity management has been added to our solution to free additional resources when needed. First results with our prototypical implementation show that our framework is capable of maximizing the cluster resource utilization.

HK 70.2 Fr 14:15 HG ÜR 6

Automatic Run-Configuration of the ALICE High Level Trigger — •Timm Steinbeck for the ALICE-HLT-Collaboration — Frankfurt Institute for Advanced Studies, University Frankfurt

The ALICE High Level Trigger (HLT) uses a pipelined and component based approach for data reconstruction and analysis. Processing components push data to the next step in the processing chain via a common interface. Data flow components transport data between nodes and merge different parts of data belonging to the same event. In order for this to work, a configuration for a processing chain has to be created before the start of a run. A repository of XML files is used to automate this, with each file holding the necessary configuration for one component, including its parents components that provide its input data. The ALICE Experiment Control System (ECS) provides a number of configuration parameters to the HLT, including an identifier for the trigger menu with the algorithms to run, a list of participating detectors, and a list of active input DDLs providing data from the detectors to DAQ and HLT. From these parameters an HLT configuration is determined fully automatically including determination of the full parent hierarchy from the top-level trigger and output components to the components receiving the data from the detector, without any manual intervention or configuration.

Work on the ALICE High-Level Trigger has been financed by the German Federal Ministry of Education and Research (BMBF) as part of its program "Förderschwerpunkt Hadronen- und Kernphysik - Großgeräte der physikalischen Grundlagenforschung".

HK 70.3 Fr 14:30 HG ÜR 6

Time synchronization and measurements of a hierarchical DAQ network — •Frank Lemke[1], Sebastian Manz[2], and Wenxue Gao[1] for the CBM-Collaboration — [1]ZITI University of Heidelberg, Germany — [2]KIP University of Heidelberg, Germany

The Data Acquisition (DAQ) system for the Compressed Baryonic Matter (CBM) experiment at the Facility for Antiproton and Ion Research (FAIR) in Darmstadt will introduce different challenges. Expected raw data rates of about 1 TB/s require online filtering and preprocessing. Detectors run in a self triggered time stamped mode depending on precise time distribution and synchronization. A readout chain has been developed, composed of a Read-Out-Controller (ROC) interfacing front-end electronics, a Data-Combiner-Board (DCB) combining data and an Active-Buffer-Board (ABB) buffering, reorganizing and transferring data via PCI express to the memory of a cluster computing node. The chain communicates via optical fibers at 2.5 Gbps. A compact control system is embedded in the ROC. A link protocol has been defined, involving three traffic classes, Data Transfer Messages, Detector Control Messages and Deterministic Latency Messages, which allow precise time distribution and synchronization within the DAQ system. The optical link is also used for clock distribution, the recov-