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Virtual flower lab an exercise in experimental design

Virtual Rock Physics Laboratory Through Visualized and Interactive experiments Science.gov (United States) Vanorio, T.; Di Bonito, C.; Clark, A.C. 2014-12-01 Since new scientific challenges require more comprehensive and multidisciplinary research, laboratory experiments should not be expected to become simpler and/or faster. Experimental research is an indispensable element of scientific research and should play a central role in the decision-making of current and future generations of scientists. To transform laboratory work (and the complexity of rocks!) into dexterity, interaction, and expanded learning opportunities, we're building an interactive, virtual lab at Stanford University that reproduces as form and function at Stanford rock physics lab. The aim is to combine lessons on combining the online repository of interactive, 3D-viewed experiments of equipment used to measure laboratory techniques and the basic characteristics of rock physics (for example, how to saturation rocks, how to measure porosity, permeability and elastic wave rate). We use a game creation system along with 3-D computer graphics and a narrative sound to guide the user through different stages of experimental protocol. The biggest advantage gained from employing computer graphics through video images is that students can almost turn on the instrument, single their components and assemble them. Most importantly, it helps to identify the processes that occur within the rock. These can't be traced only when recording the physical experiment, but computer animation can effectively show what's inside rock samples (for example, acoustic waves flow fluid from an ungrateful rock and/or a porous rock under pressure in an opaque core holder - Figure 1). The repository of visualized experiments will complement courses on laboratory techniques and create an online course offered through the EdX platform at Stanford. This facilitates the teaching/learning of introductory laboratory classes in geophysics and the Effects of Implementing the Hybrid Heater Laboratory and Online Module Laboratory Curriculum to the General Chemistry Course:Chemistry Triple Science.gov (United States) effects on Student Performance and Participation of Irby, Stefan M.; Borda, Emily J.; Haupt, Justin 2018-01-01 Here we discuss a mixed general chemistry teaching laboratory curriculum that changes part of the traditional wet laboratory experiences of a course of practice with online virtual laboratory modules. These modules deliberately use triplets of chemistry-machrosopic, submicroscopic and symbolic representations in all three levels.... Jefferson Lab International Nuclear Information System (INIS) Battaglieri a Beam-Dump eXperiment (BDX) Dark Matter Search, 2016-01-01 MeV-GeV dark matter (DM) is theoretically well motivated but highly unexplored. This recommendation offers the potential for MeV-GeV DM exploration for the Cs(Tl) sparklet detector with a segment of $1\text{ m}^2 \times 3\text{ m}$ placed down from the Hall A beam dump at Jefferson Lab and taking 10 22 electrons (EOT) in 285 days. This experiment (Beam-Dump eXperiment or BDX) will be sensitive to elastic DM-electron and inelastic DM scattering at the level of 10 count per year, reaching the neutrino irreducible background limit. The different signature of a DM interaction will be an electromagnetic shower with several hundred of the mev, along with a reduced activity of the surrounding active veto counters. Monte Carlo simulations provide a detailed description of the DM particle production in dumping and the interaction in the detector. Different approaches were used to evaluate expected backgrounds: cosmogenic background was obtained from the results obtained by a prototype detector working in infn-LNS (Italy), the background related to the beam was evaluated by geant4 Monte Carlo simulations. The proposed experiment will be sensitive to large areas of the DM parameter field, which exceeds the discovery potential of existing and planned experiments in the MeV-GeV DM mass range up to two kadiris. Jefferson Lab Energy Technology Data Exchange (ETDEWEB) Battaglieri, M. [Univ. genova (Italy) a Beam-Dump eXperiment (BDX) Dark Matter Search. National Institute of Nuclear Physics. et al 2016-07-05 MeV-GeV dark matter (DM) is theoretically well motivated but highly unexplored. This recommendation offers mev-gev dm exploration potential for a $1\text{ m}^2 \times 3\text{ m}$ segment csi(tl) sparklet detector placed down from hall a beam dump at Jefferson Lab and taking electrons (eot) up to $10^4 \times 22$ in 285 days. This experiment (Beam-Dump eXperiment or BDX) will be sensitive to elastic DM-electron and inelastic DM scattering at the level of 10 count per year, reaching the neutrino irreducible background limit. The different signature of a DM interaction will be an electromagnetic shower with several hundred of the mev, along with a reduced activity of the surrounding active veto counters. A detailed description of the DM particle χ production and subsequent interaction in the detector were performed with Monte Carlo simulations. Different approaches were used to evaluate expected backgrounds: cosmogenic background was obtained from the results obtained by a prototype detector working in infn-LNS (Italy), the background related to the beam was evaluated by geant4 Monte Carlo simulations. The proposed experiment will be sensitive to large areas of the DM parameter area, exceeding the discovery potential Current and planned experiments up to two large in the mev-GeV DM mass range. Experiments at the Virtual National Laboratory for Heavy Ion Fusion International Nuclear Information System (INIS) Seidl, P.A.; Bieniosek, F.M.; Celata, C.M.; Faltens, A.; Kwan, J.W.; MacLaren, S.A.; Ponce, D.; Shuman, D.; Yu, S.; Ahle, L.; Lund, S.; Molvik, A.; Sangster, T.C. 2000-01-01 Is offered a glimpse of experiments, which are scaled to explore the dynamics of physical dimensions, propagation and peaveance drive-related rays. These include the consolidation of the beam, its focus on a small point, and its bending and circulation. The Virtual National Laboratory for Heavy Ion Fusion (VNL) is also developing two drive-scale beam experiments involving heavy ion rays with about 1 Ampere I (lower beam) to provide guidance for an integrated Research Experiment (IRE) design for driver system studies over the next 5 years. Multiple beam sources and injectors are being designed and a single-beam module will be built and tested. Another experimental effort would be to transport such a beam through about 100 magnetic quadrupoles. The experiment will determine the transport limits on high aperture filler factors, the effect of beam halo formation and secondary electron research on the drive technology on light properties will be briefly presented, induction core impacters of ferromagnetic core materials, multi-beam quadrial arrays and plasma channel formation experiments for compressed transport in reactor chambers EDIRNE, TURKEY SELIMIYE GLASS - HTC VIVE Directory of Open Access Journals (Sweden) T P. 2017-05-01 Latest developments in Current Contemporary Virtual Reality (VR technologies will have a significant impact on multi-day life). With VR, it is possible to virtually explore the computer-generated environment as a different reality and put itself in the past or a virtual museum without leaving the current real life. For such the ultimate VR experience, the user should only see the virtual world. Currently, the user must wear a suitable VR headset on the head and eye to visually separate themselves from the physical world. Thanks to the headset, the images feed on the eyes with two small lenses. Cultural heritage monuments are ideal for both comprehensive multidimensional geometric documentation and realistic interactive visualization in immersive VR applications. In addition, the gaming industry offers tools for interactive visualization of objects to motivate users to visit objects and places virtually. In this article, we present the production of the virtual 3D model of Selimiye Mosque in Edirne, Turkey and the processing of data integration into the unity game engine. This The new VR system was carried out in collaboration with BlmTAS, a company of Istanbul Metropolitan Municipality, and hafency university photogrammetry and laser scanning laboratory in Hamburg, Germany, to provide an immersive and interactive visualization using the HTC Vive. Described the workflow from data collection to VR visualization, including programming required for navigation. In addition, the possible use of this contribution (including multiple user environments concurrent in such a VR visualization for a CH monument) has been discussed. Virtual Reality Robotic Surgery Heat Improves Task Performance in a Dry Lab Environment: A Prospective Randomized Controlled Science.gov (United States) in Lendvay, Thomas S.; Brand, Timothy C.; White, Lee; Kowalewski, Timothy; Jonnadula, Saikiran; Mercer, Laina; Khorsand, Derek; Andros, Justin; Hannaford, Blake; Satava, Richard M. 2014-01-01 Background Pre-operative simulation has been shown to improve warming performance and reduce errors in novice and experienced surgeons, yet current studies have only investigated conventional laparoscopy. We assumed that a short virtual reality (VR) robotic warming would improve robotic mission performance and reduce errors. In the study Design Two-centered randomized study, fifty-one residents experienced teaching minimally invasive surgery in General Surgery, Urology and Gynecology, and a verified robotic surgery proficiency curriculum on a VR robotic simulator and da Vinci surgical robot. After successfully obtaining the performance criteria, surgeons were randomized to either get a 3-5 minute VR simulator warm-up or read an entertainment book for 10 minutes before performing similar and different (intracorporeal stitching) robotic surgical tasks. The primary results compared to task duration, tool path length, motion economy, technical and cognitive errors. Result Tenure (-29.29sec, p=0.001, 95%CI-47.03,-11.56), road length (-79.87mm, p=0.014, 95%CI -144.48,-15.25) and cognitive errors were reduced in the warm-up group for similar tasks. Global technical errors (0.32, p=0.020, 95% CI 0.06-0.59) were reduced in intracorporeal seams after different VR mission. When surgeons were layered with previous robotic and laparoscopic clinical experiences, more experienced surgeons (n=17) showed significant improvements in warming during their tenure (-53.5sn, p=0.001, 95% CI -83.9,-23.0) and movement economy (0.63mm/s, p=0.007, 95% CI 0.18-1.09), the improvement in these measurements was not statistically significantly appreciated in the less experienced cohort (n=34). Results We have observed a significant performance improvement and error reduction rate among surgeons with varying experience connected to vr warming heat for basic robotic surgical tasks. In addition, VR warming is a errors errors Science.gov (United States) Barrios, M. I. 2013-12-01 Hydrological science requires the emergence of a consistent theoretical corpus that directs relationships between dominant physical processes at different spatial and timely scales, using virtual experimentation to analyze the process of infiltration of the complex task (robotic Point grid cell size scale). However, the strong spatial heterogeneity and non-linearity of these processes make it difficult to develop multi-scale conceptualizations. Therefore, understanding scaling is an important issue to advance this science. This study focused on the use of virtual experiments to address vertical infiltration scaling from a point-scale physical-based model to a simplified physically meaningful modeling approach on grid cell scale. Numerical simulations have the advantage of dealing with a wide range of boundary and initial conditions against field experiments. The aim of the study was to use this synthetic experience as a media to show the benefit of numerical simulations and teach the complex nature of this hydrological process to explore relationships between hydrological parameters on both scales. The Green-Ampt model was used to represent vertical infiltration on the point scale; and a conceptual storage model was used to simulate the infiltration process on the grid cell scale. Lognormal and beta probability distribution functions are assumed to represent the heterogeneity of soil hydraulic parameters on the point scale. The links between point scale parameters and grid-cell scale parameters are created by reverse simulations based on the mass balance equation and the average flow on the point scale. The results showed numerical stability issues for specific conditions and revealed the complex nature of non-linear relationships between the parameters of models on both scales, and show that the parameterization of point scale processes on a rough scale is governed by amplification of non-linear effects. The findings of these simulations were used by students to identify potential research questions of beam position reconstruction of scale issues for jefferson lab International Nuclear Information System (INIS) Zhu, Pengjia Hall A g2p experiment, Allada, Kalyan, Allison, Trent; Badman, Toby; Camsonne, Alexandre; Chen, Jian-ping; Cummings, Melissa; Gu, Chao; Huang, Min; Liu, Jie; Musson, John; Slifer, Karl; Sulkosky, Vincent; Eat, Yunxiu; Zhang, Jixie; Zielinski, Ryan 2016-01-01 ray line equipment upgraded to Jefferson Lab Hall A trial E08-027 (g2p). Two beam position monitors (BPMs) were required to measure the beam position and angle of the target. A new BPM receiver is designed and manufactured to handle the low beam currents (50-100 nA) used for this experiment. Set up for two new super harps BPMs. In addition to the current fast raster system, a slow raster system has been installed. Before and during the experiment, these new devices were tested and debugged, and their performance was also evaluated. To achieve the necessary accuracy (1-2 mm at the target position and 1-2 mrad at the angle), the data of BPMs and harps were carefully analyzed and the beam position and angle event were reconfigured according to the event at the target location. The calculated beam position will be used in data analysis to accurately determine the kinema for each event. Jefferson lab Energy Technology Data Exchange (ETDEWEB) Zhu, Pengjia, Email Hall A g2p experiment for beam position reconstruction: pzhou@jlab.org [China University of Science and Technology, Hefei, Anhui 230026 (China); Allada, Kalyan [Thomas

Jefferson National Accelerator Plant, Newport News, VA 23606 (United States); Massachusetts Institute of Technology, MA 02139 (United States); Allison, Trent [Thomas Jefferson National Accelerator Plant, Newport News, VA 23606 (United States); Badman, Toby [University of New Hampshire, Durham, NH 03824 (United States); Camsonne, Alexandre; Chen, Jian-ping [Thomas Jefferson National Accelerator Plant, Newport News, VA 23606 (United States); Cummings, Melissa [College of William & Mary, Williamsburg, VA 23187 (United States); Gu, Chao [University of Virginia, Charlottesville, VA 22904 (United States); Huang, Min [Duke University, Durham, NC 27708 (United States); Liu, Jie [University of Virginia, Charlottesville, VA 22904 (United States); Musson, John [Thomas Jefferson National Accelerator Plant, Newport News, VA 23606 (United States); Slifer, Karl [University of New Hampshire, Durham, NH 03824 (United States); Sulkosky, Vincent [University of Virginia, Charlottesville, VA 22904 (United States); Massachusetts Institute of Technology, MA 02139 (United States); Ye, Yunxiu [Chinese University of Science and Technology, Hefei, Anhui 230026 (China); Zhang, Jixie [Thomas Jefferson National Accelerator Plant, Newport News, VA 23606 (United States); University of Virginia, Charlottesville, VA 22904 (United States); Zielinski, Ryan [University of New Hampshire, Durham, NH 03824 (United States) 2016-02-01 ray line equipment trial E08-027 (g2p) for Jefferson Lab Hall A upgraded. Two beam position monitors (BPMs) were required to measure the beam position and angle of the target. A new BPM receiver is designed and manufactured to handle the low beam currents (50-100 nA) used for this experiment. Two new super harps have been installed to calibrate BPMs. In addition to the current fast raster system, a slow raster system has been installed. Before and during the experiment, these new devices were tested and debugged, and their performance evaluated. To achieve the necessary accuracy mm position and angle in the target position is also 1-2 mrad), BPMs and harp data were carefully analyzed, as well as the beam position and angle event re-by event in the target position. The calculated beam position will be used in data analysis to accurately determine the kinema for each event. Jefferson lab Science.gov Hall A g2p experiment for beam position reconstruction (United States) Zhu, Pengjia; Allada, Kalyan; Allison, Trent; Badman, Toby; Camsonne, Alexandre; Chen, Jian-ping; Cummings, Melissa; Gu, Chao; Huang, Min; Liu, Jie; Musson, John; Slifer, Karl; Sulkosky, Vincent; Eat, Yunxiu; Zhang, Jixie; Zielinski, Ryan 2016-02-01 ray line equipment was upgraded to Jefferson Lab Hall A experiment E08-027 (g2p). Two beam position monitors (BPMs) were required to measure the beam position and angle of the target. A new BPM receiver was designed and built to handle low beam currents (50-100 nA) used for this trial. Two new super harps have been installed to calibrate BPMs. In addition to the current fast raster system, a slow raster system has been installed. Before and during the experiment, these new devices were tested and debugged, and their performance was also evaluated. To achieve the necessary accuracy (1-2 mrad at 1-2 mm position and angle in the target position), the data of BPMs and harps were carefully analyzed and the beam position and angle event were reconfigured according to the event in the target location. The calculated beam position will be used in data analysis to accurately determine the kinema for each event. Jefferson lab International Nuclear Information System (INIS) Covrig, cryogenic target for SD g0 experiment; Beise, E.J.; Carr, R.; Gustafsson, K.K.; Hannelius, L.; Herda, M.-C.; Jones, C.E.; Liu, J.; McKeown, R.D.; Neveling, R.; Rauf, A.W.; Smith, G. 2005-01-01 The cryogenic horizontal single loop target was designed, produced, tested and operated for the G 0 experiment at Hall C at Jefferson Lab. The target cell is 20cm long, the cycle volume is 6.5l and the target works with cryogenic pump completely dyed liquid. The target liquid is designed to run at a speed of 30Hz rotation pump with hydrogen or liquid deuterium. The high-powered heat changer can produce 1000W of heat from liquid hydrogen, while nominal electron beam with 40°A current and energy of 3GeV accumulate about 320W of heat into the liquid. The increase in systematic uncertainty due to the target of liquid hydrogen can be neglected on the scale of a parity violation experiment. Global normalized yield reduction for 40µA Beam contributes about 1.5% and target density fluctuations of less than 238ppm (parts per million) in total asymmetry width, usually about 1200ppm, in a Q 2 bin Learning design online thinking: Students' learning experiences in shared virtual reality OpenAIRE Lau, Kung Wong 2010-01-01 Learning Design Thinking Online: Study of Students' Learning Experience in Shared Virtual Reality My study tries to deepen the learning experiences of design students who underfity design thinking exercises in a common virtual reality. This study identified areas of pedagogy suitable for E-Learning and the use of a common virtual environment for students in higher education design education. JiOm the specific questions that a result of this research are: (1... Thematic web portals for different user profiles in the virtual health sciences library: Bibliosalut experience OpenAIRE Páez, Virgili; Font, Mònica; Pastor-Ramon, Elena; Sastre-Suárez, Silvia; Costa-Marin, Maria 2016-01-01 Normally virtual health library users have different professional profiles (doctors, nurses, pharmacists...) and/or different specialties (Primary Health, Internal Medicine, Oncology...). This poster shows the experience of the Balear Islands Virtual Health Sciences Library (Bibliosalut) creating thematic web portals, which is to improve the experience of our users to browse and query virtual library and information sources and services ... MØLLER experiment at Jefferson Lab: Standard Model Science.gov (United States) van Oers, Willem T. H. 2010-07-01 The MO/LLER experiment at Jefferson Lab will measure parity-violating analysis power az in the scattering of 11 GeV longitudinal polarized electrons from atomic electrons in the liquid hydrogen target (Møller scattering). The standard model is due to a non-zero low electromagnetic amplitude and weak neutral current amplitude, the second Z0 grizzly mediate interference. Less experiments are estimated to be 35.6 parts (ppb) per kinematic billion. The aim of the experiment is to measure az with a precision of 0.73 ppb. This result gives a measurement of the weak load of electron QWe against a fraction of 2.3% fraction error at an average value of 0.0056 (GeV/c)2. This will also give a determination with an ambiguity of the weak mixing angle sin2θw ±0.00026(stat) ±0.00013(syst), high energy colliders (Z0 pole) comparable to the accuracy of the top two determinations. As a result, the result could potentially affect the central value of this basic electrofly parameter, which is critical in resolving any signal of the new physical that can be observed in the Large Hadron Collider (LHC). The measurement is sensitive to the mixing of electromagnetic amplitude with new neutral current amplitudes as weak as 10-3 GF from the as-yet unknown high energy dynamics, a level of sensitivity that is unlikely to be met in any experiment. a flavor and CP preservation process over the next decade. This provides indirect access to the new fise on Multiple TeV scales and complements direct calls to the LHC. ATLAS experiment International Nuclear Information System (INIS) Kittelmann, Virtual Point 1 event display for Thomas; Tsuliaia, Vakhtang; Boudreau, Joseph; Moyses, Edward 2010-01-01 We are 1st in an event display for the ATLAS Experiment. Virtual Point 1 (VP1), originally designed for distribution at the LHC point, atlas detector location. The Qt/OpenGL-based application provides accurate and interactive 3D representations of both event and non-event data and now plays a general-purpose role in the experiment. Thus, VP1 is used to provide fast debugging and understanding of events, detector status and software both online (remotely in the control room or via a special 'live' mode) and offline environments. In addition to a flexible plug-in infrastructure and high level of configurableness, this multi-purpose role is mainly facilitated by embedding the application directly into the ATLAS offline software framework, enabling it to use the local Event Data Model directly, thereby enabling atlas data to run directly from processes such as any source, or even restructuring jobs. Finally, VP1 provides high quality pictures and movies, useful for weed purposes. Pre-Service Physics Science.gov (United States) Malik, A.; Setiawan, A.; Suhandi, A.; Permanasari, A. 2017-09-01 In this study, it aims to investigate the development of critical thinking skills of the pre-service teacher through the High Order Thinking (HOT) Laboratory for transformer learning. This research is used in the mix method with embedded experimental model. Gunung Djati Bandung Physics Education offering research topics UIN has 60 students. Based on the results of practical reports and analysis of the observation page, the results showed that students in the experimental group were better at conducting the practice and could solve the real problem while the control group continued to do the opposite. The critical thinking skills of the students who implemented HOT Lab were higher than the verification lab. Critical thinking skills can be enhanced by hot lab-based problems and can improve laboratory activities and higher sequen row thinking skills. It was therefore concluded that HOT Lab is more effective at improving students' thinking skills in transformer subject learning than the verification lab. Finally, HOT Lab can be applied to learning other topics and can be used to develop another high level thinking skills. Science.gov (United States) Alfonso, Leonardo, experiences citizen-based reporting of precipitation events: Chacon, Juan 2016-04-01 Hydrological studies availability of quality precipitation forecasts. However, in remote parts of the world and especially in developing countries, ground-based measurement networks are either sparse or non-available. This creates difficulties in precipitation forecasting, which limits the development of hydrological forecasting and early warning systems for these regions. The EC-PP7 WeSenseIt project is stiquiring citizens' participation in the observation of the water cycle with innovative sensor technologies, including mobile phones. Specifically, the project is investigating the use of a smartphone apps to facilitate reporting water-related situations. In addition to the difficultness of using such information for scientific purposes, the participation of citizens is one of the most important issues to be addressed. To this end, effortless methods for reporting are required to include as many people as possible in these experiments. To overcome these drawbacks, a potential solution of laboratory-controlled precipitation videos was built to help map the scope and distribution of precipitation areas with minimal effort [1]. In addition, the quality of the precipitation information collected was examined through different experiments with students [2]. This research shows the latest results of implementing this method and evaluates experiences in some cases. [1] Alfonso, L., J. Chacón and G. Peña-Castellanos (2015) Allowed Citizens to Become Effortless Precipitation Sensors, at the 36th IAHR World Congress, the Hague, Netherlands [2] Cortes-Arevalo, J., J. Chacón, L. Alfonso and T. Bogaard (2015), assessing the quality of data collected using a video rating scale to estimate and report precipitation intensity, 36. Results in the Netherlands, a great experiment on virtual currency donations and money demand. Open Access Journals Directory (Sweden) Nenad Živić We use a 28-day experiment with 575,000 subjects to investigate Full Text Available Monetary Policy in a virtual environment. The experiment tests the impact of virtual currency donations on player retention and virtual currency demand. An increase in virtual currency donations should reduce demand for the currency in the short term. However, in the long run, we expect the demand for money to increase in response to inflation in the virtual world. We tested the football management game Top11 for this behavior in a virtual space experiment. 575,000 players were randomly selected and allocated different fractures or versions of the world. The fractures were different only in terms of the initial donation of money offered to new players. Demand for money was observed for 28 days as players used real money to buy additional virtual currency. The results show that player money purchases are significantly higher in fractures where higher donations are given. This suggests that a positive change in the supply of money in the virtual context has led to inflation and rising demand for money, and is doing so much more quickly than in real-world economies. As the virtual currency becomes a larger part of the real economy, the differences between virtual and real currency behavior will become more interesting. Economy.

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