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New nucleus ^{277}Hs : in between two islands of stability

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The nuclear fusion reactions $^{244}\text{Pu}(48\text{-Ca}, 3n)^{289}\text{-114}$ and $^{244}\text{Pu}(48\text{-Ca}, 4n)^{288}\text{-114}$ were studied at the new, highly efficient gas-filled recoil separator TASCA. The large number of thirteen observed decay chains assigned to $^{288}\text{-114}$ and $^{289}\text{-114}$ enabled reliable cross sections measurements. The highest cross section was $8.2 (+4.0 / -2.8)$ pb measured for the $4n$ evaporation channel. The new nucleus ^{277}Hs was observed. It decayed by spontaneous fission after a lifetime of 4.5 ms. Model calculations, which reproduce the properties of nuclides in the region around longer-lived deformed doubly-magic ^{270}Hs well suggest ^{277}Hs to be located near a minimum of shell stabilization between this island of deformed nuclei and the island of stability of spherical superheavy nuclei.

Primary authors: Dr YAKUSHEV, Alexander (Technische Universität München, 85748 GARCHING, GERMANY); Prof. TÜRLER, Andreas (Paul Scherrer Institute and Bern University, CH-5232 VILLIGEN PSI, SWITZERLAND); Prof. DÜLLMANN, Christoph (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Prof. KRATZ, Jens-Volker (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Dr EBERHARDT, Klaus (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Dr SCHÄDEL, Matthias (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY)

Co-authors: Mr GORSHKOV, Alexander (Technische Universität München, 85748 GARCHING, GERMANY); Dr SEMCHENKOV, Andrej (University of Oslo, 0315 OSLO, NORWAY); Ms HÜBNER, Annett (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr LOMMEL, Bettina (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr KINDLER, Birgit (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Mr HILD, Daniel (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Dr ACKERMANN, Dieter (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Mr LIEBE, Dirk (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Prof. RUDOLPH, Dirk (Lund University, 22100 LUND, SWEDEN); Mr PARR, E. (University of Liverpool, LIVERPOOL, L69 7ZE, UK); Mr JÄGER, Egon (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Mr SCHIMPF, Erwin (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr HESSBERGER, Fritz-P. (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Ms SCHAUSTEN, Gitta (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr ESSEL, Hans (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Prof. NITSCHKE, Heino (Lawrence Berkeley National Laboratory, BERKELEY, California 94720, USA); Dr GATES, Jacklyn Marie (Technische Universität München, 85748 GARCHING, GERMANY); Dr KHUYAGBAATAR, Jadambaa (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr DVORAK, Jan (Lawrence Berkeley National Laboratory, BERKELEY, California 94720, USA); Prof. OMTVEDT, Jon Petter (University of Oslo, 0315 OSLO, NORWAY); Dr UUSITALO, Juha (University of Jyväskylä, 40014 JYVÄSKYLÄ, FINLAND); Mrs EVEN, Julia (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Ms STEINER, Jutta (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Mr KRIER, Jörg (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Mr RUNKE, Jörg (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Dr GREGORICH, Kenneth E. (Lawrence Berkeley National Laboratory, BERKELEY, California 94720, USA); Dr AN-

DERSSON, Lise Lotte (University of Liverpool, LIVERPOOL, L69 7ZE, UK); Dr WEGRZECKI, M. (Institute of Electron Technology, 02-668 WARSAW, POLAND); Dr BLOCK, Michael (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr MAITI, Moitri (Saha Institute of Nuclear Physics, KOLKATA-700064, INDIA); Dr KURZ, Nikolaus (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr WIEHL, Norbert (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Mr ELLISON, Paul (Lawrence Berkeley National Laboratory, BERKELEY, California 94720, USA); Ms THÖRLE-POSPIECH, Petra (Johannes Gutenberg-Universität Mainz, 55128 MAINZ, GERMANY); Mr GRAEGER, Reimar (Technische Universität München, 85748 GARCHING, GERMANY); Prof. HERZBERG, Rodi-D. (University of Liverpool, LIVERPOOL, L69 7ZE, UK); Prof. LAHIRI, Susanta (Saha Institute of Nuclear Physics, KOLKATA-700064, INDIA); Mr HARTMANN, Willi (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY); Dr BRÜCHLE, Willy (Gesellschaft für Schwerionenforschung mbH, 64291 DARMSTADT, GERMANY)

Presenter: Prof. TÜRLER, Andreas (Paul Scherrer Institute and Bern University, CH-5232 VILLIGEN PSI, SWITZERLAND)

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