# HEAVY AND SUPERHEAVY ELEMENT SYNTHESIS AT THE DUBNA GAS FILLED SEPARATOR

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The ‘Hot Fusion Island’ is formed by over 50 super-heavy nuclei identified in fusion-evaporation reactions between $^{48}$Ca beams and actinide targets [1-3]. Most of these nuclei have been discovered in experiments at the Dubna Gas Filled Recoil Separator (DGFRS). These studies have been recently augmented by using a new highly segmented Si detector and digital detection system [4,5] commissioned by the ORNL-UTK team and implemented at the DGFRS. The system has robust analysis capabilities, especially for very short lived activities and detection efficiency at high beam rate.

The utility of this new system will be detailed by discussing the observation of heavy and superheavy recoils and the subsequent alpha and/or spontaneous fission radiations. The measurement of several Th activities from the $^{48}$Ca + $^{nat}$Yb calibration reaction will be shown including activities on the order of 1μs. We will also show new results from the spontaneous fission and alpha decay of heavy and super-heavy implants observed during irradiations of Pu and Cf targets with $^{48}$Ca projectiles. The evidence for a new Flerovium isotope will be shown[5] as well as details of the ongoing experiment which attempts to go beyond the edge of the nuclear chart to create the heaviest isotopes of element 118 yet synthesized.

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