Abstract Submitted
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Feasibility of Production of Moly-99 via 1-neutron Exchange Reaction 98Mo+100Mo→299Mo in Strong-Focusing Auto Collider ("EXY-DER") of natural Molybdenum nuclei based on T and He-3 production data from d+d weak focusing Auto-Collider MIGMA IV TIM HESTER, BOGDAN MAGLICH, California Science & Engineering Corporation (CALSEC), CALSEC COLLABORATION — Copious T and ^{3}He production from D(d, p) T and D(d, n) ^{3}He reactions in 725 KeV colliding beams was observed in weak-focusing Self-Collider[1–4] radius 15 cm, in B = 3.12 T, stabilized[5] non-linearly by electron cloud oscillations with confinement time $\sim$ 23 s. BARC's simulations[7] predict that by switching to Strong Focusing Self Collider proposed by Blewett[6], 10 deuterons 0.75 MeV each, will generate 1 ^{3}He + 1T +1p + 1n at a total input energy cost of 10.72 MeV. Economic value of T and ^{3}He is 65 and 120 MeV/atom respectively. While energy balance is negative, we project economic gain 205 MeV/10.72 MeV $\sim$ 20 i.e. ^{3}He production/sale will fund cost of T. Assuming the luminosity achieved in MIGMA IV, we replace D beam injection with a high energy beam of 14 times ionized natural Mo ions and look for the 1-neutron reactions of the type ^{98}Mo+^{100}Mo→2^{99}Mo, where ^{99}Mo^{14+} will be EM channeled into a mass spectrometer and collected at one loci/ radius, while all other masses/radii rejected. Physics and engineering parameters required to produce at least 1 g of ^{99}Mo per day, at an electricity cost of $100K, will be presented. 2- and 3- neutron exchange reactions will be considered, too.

Tim Hester
California Science & Engineering Corporation (CALSEC)

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