Abstract Submitted
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Soft Fusion Energy Path: Isotope Production in Energy Subcritical/Economy Hypercritical D+D Colliding-Beam Mini Fusion Reactor 'Exyder' TIM HESTER, BOGDAN MAGLICH, California Science & Engineering Corporation (CALSEC), CALSEC COLLABORATION — Bethe[1] and Sakharov[2] argued for soft fusion energy path via isotope production, substantiated by Manheimer[3]. - Copious T and ^{3}He production[4, 5] from D(d, p) T and D(d, n) ^{3}He reactions in 725 KeV D+D colliding beams was measured in weak-focusing Self-Collider[6, 7] radius 0.15 m, in B = 3.12 T, non-linearly stabilized by electron cloud oscillations[8] to confinement time = 24 s. Simulations[6] predict that by switching to strong focusing[9], 10 deuterons 0.75 MeV each, generate 1 ^{3}He +1T +1p + 1n at total input energy cost 10.72 MeV. Economic value of T and ^{3}He is 65 and 120 MeV/atom, respectively. We obtain economic gain 205MeV/10.72 MeV $\sim$ 2,000% i.e. ^{3}He production funds cost of T. If first wall is made of Thorium n's will breed ^{233}U releasing 200 MeV/fission, at neutron cost 5.36 MeV *versus* 160 MeV in beam on target, resulting in no cost ^{3}He production, valued \$75K/g. 1. Physics Today, May 1979, p.44; 2. Memoirs, Vintage Books, (1992); 3. Phys. Today, May 2012 p. 12; 4. Phys. Rev. Lett. **54**, 796 (1985); 5. Bull. APS, **57**, No. 3 (2012); 6. Part. Acc.1, (1970); 7. ANEUTRONIC FUSION NIM **A 271** 1-167 (1988); 8. Phys. Rev. Lett. **70**, 1818 (1993); 9. Part. Acc. **34**, 13 (1990).

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