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Wide-bandwidth solar energy harvest by using non-linear optics and fluid dynamic ABUL HASANAT MUHAMMAD JAHANUR RAHMAN, Texas A&M University, Physics & Astronomy Department researcher — Existing solar technology converts only limited bandwidth of radiation into electricity due to Shockley-Queisser limit of the solar diodes. Rest get wasted by heating up the solar array or reflected back. This paper represent mechanical method of producing more electricity by absorbing wide-bandwidth of sun-rays. Thin organic solar panel sheet or perovskite cell is coated with nanoparticle for reflecting non-absorbed bandwidth of sun rays. This sheet can be bend into concave shape with different focal radius. By using solar cell mirror made of this panel with MPPT, a solar farm can be made that converts some of the solar energy into electricity and reflects rest of the solar bandwidth into one single focus location where a series of lenses and prisms are located. These lenses convert incoming-rays into collimated-Gaussian-beam, which goes through two multimode circular prisms with different refractive indexes in close loop waveguide for ring lasing pulse generation. This introduce Doppler broadening into these two anti-collinear beam across the cross-section of the laminar fluid flow, where center fluid layer has higher velocity than the boundary layer. So, higher frequencies come out near the circumference of one of the prism and lower frequencies come out from its center. And the other one has opposite effect. Two beams are tuned to be out of phase, which increases absorption by fluid. Similar to laser-cooling technique, all fluid atoms are excited to same virtual-energy-state in exchange of solar-power and fluid-momentum. This two photon absorption release narrow-bandwidth-high-intensity pulse that produce electricity in multi-channel-plates (MCP).

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