Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

A total-flow design of geothermal power generator using Turgo turbines[1] TZU-YUAN LIN, HSIEH-CHEN TSAI, National Taiwan University — We combine Turgo turbines and two-phase supersonic nozzles to design a total-flow geothermal power generator. The high-pressure subcooled liquid from the well forms supersonic flashing jets through the nozzles and the high-speed two-phase jets imping turbine blades obliquely to drive the Turgo turbine. This new generator converts geothermal power directly from the geothermal fluid without implementing any phase separator or heat exchanger, which results in a simple and easy-to-maintain system. Compared with traditional Organic Rankine Cycle (ORC) generators, results from theoretical analysis and field tests in Yilan, Taiwan show that the new design of geothermal power generator has a competitive geothermal efficiency operating at moderate reservoir enthalpy.

[1]This project is supported by Lanyang Geothermal Corp., Taiwan

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Date submitted: 31 Jul 2019 Electronic form version 1.4