

## **V-I characteristics of a coreless ironless electric generator in a closed-circuit mode for low wind density power generation**

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### **ABSTRACT**

This research deals with removal of ironcore lamination in electric generator to eliminate cog torque. A confinement technique is proposed to confine and focus magnetic flux by introducing opposing permanent magnets arrangement. The generator was fabricated and experimentally validated to qualify its loaded characteristics. The rotational torque and power output are measured and efficiency is then analyzed. At 100 $\Omega$  load, the generator power output increased with the increased of rotational speed. Nearly 78% of efficiency was achieved when the generator was rotated at 250rpm. At this speed, the generator produced RMS voltage of 81VAC. Torque required to rotate the generator was found to be 3.2Nm. The slight increment of mechanical torque to spin the generator was due to the counter electromotive force (CEMF) existed in the copper windings. However, the torque required is still lower by nearly 30% than conventional AFPM generator. It is there concluded that this generator is suitable to be used for low wind density power generation application.

### **KEYWORDS:**

Efficiency; Electric windings; Timing circuits; Torque