California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

CJ Moore

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Pulse Oscillation and Inductive Coupling of a Solid State Air Core Resonating Transformer

Science Fair Use Only

S0616

Division

_ Junior (6-8) _X_ Senior (9-12)

Preferred Category (See page 5 for descriptions.)

6 - Electricity & Electronics

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

1. Problem Statement: In a solid air core transformer, is the inductive coupling of volts to a separate search coil, in relation to the distance from the center of the primary coil a linear equation?

2. Hypothesis: The energy transfer will not be a linear equation. The pulse oscillation through the primary coil creates a powerful magnetic field, yet because no gauss meter was readily available there will be no way to measure the shape or magnitude of the magnetic fields. No readings outside of the field will be taken, and as soon as the seach coil breaches the outer area of the field, the voltage transferred will increase in astronomical amounts. Therefore I have made a temporary conclusion that the relationship will not be linear, nor will it be exponential, but a completely random set of data.

3. Materials: 2x 30 inch dia. press board, 5 lb. spool of 22 gauge magnet wire, multimeter, 2x 16 KVDC .02 capacitors, 9 inch dia 27 inch long pvc pipe, table/buzz saw, drill press, drill (handheld), 50 foot roll of # inch thin walled copper refrigeration tubing. 2x 10 kv 23 ma ignition transformers, electric tape, 12 foot 2x4.

4. Procedure: a) Construct Tesla Coil 1. Wire transformers in parallel, 2. Wind secondary coil, and primary coil, using 22 gauge and # in, respectively. 3. Connect various parts to match previously drawn sche matic. b) Construct search coil, (wrap wire around pipe) c) Start search coil at great distance and run coil, recording any readings d) Repeat previous step decreasing distance by 1 inch. e) Repeat previous steps 3 times to make four total trials

5. Results: There were no readings at any distance greater than 10 inches, and at any distance smaller than 8 the readings were to high for the multimeter to measure.

6. Conclusion: The fact that the only readings taken were from 10 # 8 inches before they were to high, prove that there was an extremely powerful and static magnetic field surrounding the wires.

Summary Statement (In one sentence, state what your project is about.)

My project is about using magnetic fields to transmit energy to another location without any common connection.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Neighbor operated drill press; father cut plywood with buzz saw.