California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

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

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)
Exploring Equations for KI Using the Optical Method of Caustics

Science Fair Use Only

S1409

Division
S Junior (6-8) S Senior (9-12)

Preferred Category (See page 5 for descriptions.)
14 - Physics & Astronomy

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.

The (shadow) optical method of caustics is applied to three different equations for the measurement of the stress intensity factor using cellulose acetate. This method is then used to analyze the significant differences between these equations and their variables. One equation depends heavily on the stress optical constant: the theory of caustics was applied to determine this constant for cellulose acetate. The three equations were extrapolated using a light transmission arrangement with parallel light. The light emanates from a common slide projector and is directed onto the crack tip of the specimen. Two of the equations present themselves to be interrelated. One of the equations is found to be irrelevant when it is not used with the intended arrangement.

Summary Statement (In one sentence, state what your project is about.)
Cellulose acetate is used to verify the validity of the optical method of caustics and it;s equation(s).

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.