

Abstract Submitted  
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**Investigation of Marine Derived DNA for use as a Cladding Layer in Electro-Optics** JOSHUA HAGEN, University of Cincinnati, STEPHEN CLARSON, JAMES GROTE, Wright Patterson Air Force Base, PERRY YANEY, University of Dayton, UNIVERSITY OF CINCINNATI TEAM, WRIGHT PATTERSON AIR FORCE BASE TEAM, UNIVERSITY OF DAYTON TEAM — Deoxyribonucleic Acid (DNA) extracted and purified from salmon sperm was investigated for use in electro-optic devices as a cladding layer. DNA was analyzed as a cladding material for two different chromophore systems, Disperse Red 1 (DR1), and Cheng-Larry Dalton 1 (CLD1) in a PMMA guest/host system. A baseline device, comprised only of a 1.7micron layer of PMMA, was tested for non-linearity with each chromophore, with the  $r_{33}$  value increasing with increasing temperature and voltage. Doublestack devices included a 1micron thick DNA film as the cladding layer with the baseline core layer above. The recorded  $r_{33}$  values were accurate within 5 percent of the calculated values with the DR1 chromophore, and within 20 percent with the CLD1 chromophore, hence showing good device reproducibility. In addition to the application of a cladding layer, DNA has possible applications in other electronic devices. This prospect is possible by the relationship of molecular weight to electrical resistivity, with resistivities reaching  $1 \times 10^8 \text{ Ohm} \cdot \text{cm}$ .

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