University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

JOSEPH PAUL KOVACS

BSc (Brock University, 2013)

"Design, Construction, and Analysis of a Solid State Nearly-Isotropic Light Source"

Department of Physics and Astronomy

Thursday, October 27, 2016
9:30 A.M.
David Turpin Building
Room A144

Supervisory Committee:
Dr. Justin Albert, Department of Physics and Astronomy, University of Victoria (Supervisor)
Dr. Randall Sobie, Department of Physics and Astronomy, UVic (Member)
Dr. Alexander Briggs, Department of Chemistry, UVic (Outside Member)

External Examiner:
Dr. Arnold Gaertner, Research Officer, National Research Council Canada

Chair of Oral Examination:
Dr. Margaret Penning, Department of Sociology, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Isotropic radiators are known to be a useful tool across a wide range of applications, from applications in light dosimetry in human/animal tissue to calibration of sensitive laboratory equipment. While the benefits are known, constructing such a tool has proven to be difficult. Currently, there are no commercially available isotropic or nearly isotropic radiators. Previous attempts at constructing an isotropic radiator have been limited to a $\pm 10\%$ isotropy level. This thesis covers the design, construction, and analysis of a nearly isotropic optical light source. The constructed source has extrema anisotropies, over a solid angle of approximately 3π steradians, of $^{+2\%}_{-4\%}$ (with 95% of that solid angle being within $\pm 1.7\%$ anisotropy).