



Canadian Organization of
Medical Physicists

Organisation Canadienne
des Physiciens Médicaux

COMP SCIENTIFIC PROGRAM
CCPM SYMPOSIUM:
BIOPHOTONICS

PROGRAMME SCIENTIFIQUE DE L'OCPM
SYMPOSIUM DU CCPM:
BIOPHOTONIQUES

**CANADIAN
COLLEGE OF
PHYSICISTS IN
MEDICINE**



**LE COLLÈGE
CANADIEN
DES PHYSICIENS
EN MÉDECINE**

Proceedings of the 54th Annual Scientific Meeting
Compte-rendu de la 54^e assemblée scientifique annuelle

Québec City, 2008

WEDNESDAY, JUNE 25, 2008

PUBLIC LECTURE

Cancer Treatment: Past, Present, and Future

Dr Paul-Émile Raymond & Prof Jerry Batista

Grand Salon, Pav Desjardins, Université Laval

7:30 – 9:00 p.m.

THURSDAY, JUNE 26, 2008

OFFICIAL OPENING

8:30 a.m.

CCPM Symposium

Biophotonics

Grand Salon, Pav Desjardins, Université Laval

Chair / Président: **Dick Drost**, St. Joseph's Health Centre, London, Ontario

8:45 a.m.	CCPM Symposium I – 01	<i>Biomedical imaging with optical coherence tomography (OCT): from bench to bedside, or what's light got to do with it?</i> <i>A. Vitkin</i>	
9:30 a.m.	CCPM Symposium I – 02	<i>Use of magnetic fields for optical monitoring of oxygen</i> <i>O. Mermut, J-F. Cormier, S. Leclair, M.L. Vernon, J-S. Marois, J-F. Morin, K.R. Diamond, M.S. Patterson</i>	

COFFEE BREAK EXHIBITS OPEN	Location
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11:00 a.m.	CCPM Symposium II – 01	<i>TBD</i> <i>Daniel Côté, Dept. de Physique, Centre de Recherche Université Laval Robert Giffard</i>	
11:45 a.m.	CCPM Symposium II – 02	<i>TBD</i> <i>Daniel Houde, Université de Sherbrooke</i>	

LUNCH BREAK EXHIBITS OPEN	Location
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SCIENTIFIC SESSION
Radiation Therapy Tx Delivery & Verification Imaging
Grand Salon, Pav Desjardins, Université Laval
2:00 – 4:00 p.m.

Chair / Président: **Daniel Tremblay**, CHUQ – Hôtel-Dieu de Québec

2:00 p.m.	Sci-Thurs PM-01	<i>Sliding Window IMRT: Uncertainties of the leading edge and plateau of the beam profile</i> G. Grigorov, J. Chow, N. Yazdani, R. Barnett	
2:10 p.m.	Sci-Thurs PM-02	<i>Improving image quality produced by CCD cameras exposed to stray radiation from a medical linac</i> L. Archambault, T.M. Briere, and S. Beddar	
2:20 p.m.	Sci-Thurs PM-03	<i>Optical Imaging of Microscopic Radiation Dose Gradients using a Digital Microscope</i> B.M. Keller, C. Peressotti, J-P Pignol	
2:30 p.m.	Sci-Thurs PM-04	<i>Comprehensive fluence model for absolute portal dose image prediction in IMRT pre-treatment verification</i> K. Chytyk, B. McCurdy	
2:40 p.m.	Sci-Thurs PM-05	<i>One Year of Learning from Incidents</i> B.G. Clark, R. Brown, A. Kind, D. Wilkins, L. Grimard	
2:50 p.m.	Sci-Thurs PM-06	<i>2-D Lag and Response Nonlinearity Corrections for Dynamic IMRT Verification Using an EPID</i> S. Steciw, B. Warkentin, S. Rathee, G. Fallone	
3:00 p.m.	Sci-Thurs PM-07	<i>Evaluation of prospects to use daily megavoltage CT studies for adaptive radiotherapy</i> S. Yartsev, C. Woodford, A.R. Dar, G.S. Bauman, J. Van Dyk	
3:10 p.m.	Sci-Thurs PM-08	<i>Investigation of the Source of RF Noise from a Modulator for an MR-linac Project</i> M. Lamey, B. Burke, S. Rathee, B.G. Fallone and M. Carlone	
3:20 p.m.	Sci-Thurs PM-09	<i>Improving megavoltage portal image contrast with low atomic number target materials</i> E. Orton, R. Kelly, J. Robar	
3:30 p.m.	Sci-Thurs PM-10	<i>Marker Trajectory Reconstruction Using Cone-Beam CT Projection Images</i> N. Becker, I. Kay	
3:40 p.m.	Sci-Thurs PM-11	<i>Image Guidance for Prostate IMRT Using Low Dose Cone Beam CT</i> M. Wierzbicki, B. Schaly, E. Osei, R. Barnett	
3:50 p.m.	Sci-Thurs PM-12	<i>Correction and calibration of megavoltage cone-beam CT images for the calculation of the dose of the day</i> J-F. Aubry, J. Cheung, S. Yom, A. Gottschalk, M. Aubin, O. Morin, M. Descovich, L. Beaulieu, J. Pouliot	

COFFEE BREAK EXHIBITS OPEN	Location
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CCPM ANNUAL GENERAL MEETING

Grand Salon, Pav Desjardins, Université Laval

4:30 – 6:00 p.m.

General Poster Discussion and Reception

Grand Salon, Pav Desjardins, Université Laval

6:00 – 10:00 p.m.

Poster – 01	<i>Comparison of clinical IMRT plan quality and delivery accuracy: Few large segments vs many small segments</i> S. Sawchuk , S. Karnas, K. McCune, M. Mulligan, R. Dar, J. Chen	
Poster – 02	<i>3 Dimensional Ultrasound-Guided Breast Brachytherapy</i> P. DeJean, L. Beaulieu, A. Fenster	
Poster – 03	<i>Dose verification using a 2D diode array (Mapcheck) for electron beam modeling, QA and patient customized cutouts</i> E. Ghasroddashti, S. Sawchuk	
Poster – 04	<i>Mathematical Modeling of Liver Metastases Tumour Growth and Control with Radiotherapy</i> A. Campbell, M. Davidson, M. Lock, and E. Wong	
Poster – 05	<i>An Assessment of PDDs and Outputs Predicted by A Monte Carlo-based Treatment Planning System for Electron Beams</i> I. AlDahlawi, M. Evans, B. Reniers, K. Asiev, J. Last, W. Parker, F. DeBlois	
Poster – 06	<i>Maximizing Eclipse IMRT Dose Accuracy by Adjusting the Dosimetric Leaf Gap Parameter</i> B. Poffenbarger, C Audet	
Poster – 07	<i>The Dosimetric Consequences of MLC Position Inaccuracy in IMRT</i> A. Rangel, P. Dunscombe	
Poster – 08	<i>Passive Shimming Optimization of a Permanent Magnet Structure for a Prototype Coupled MRI-Medical Linear Accelerator</i> T. Tadic, B.G. Fallone	
Poster – 09	<i>Evaluation of a Commercial 2D Ion-Chamber Array for Intensity Modulated Radiation Therapy Dose Measurements</i> X. Mei, G. Bracken, A. Kerr	
Poster – 10	<i>The Accuracy of MU Calculations for Enhanced Dynamic Wedge with the Varian's Anisotropic Analytical Algorithm</i> G. Salomons, A. Kerr, X. Mei, D. Patel	
Poster – 11	<i>Quantitative Imaging of 213Bi alpha-emitter with a beta-Imager</i> R. Hobbs, H. Song, G. Sgouros	
Poster – 12	<i>A needle-positioning robot co-registered with volumetric x-ray micro-computed tomography images for minimally-invasive small-animal interventions</i> A.C. Waspe, D.W. Holdsworth, J.C. Laceyfield, A. Fenster	
Poster – 13	<i>Modeling the effect of organ motion on cumulative rectal dose using EUD</i> R. Jiang, R. Barnett, J. Chow	
Poster – 14	<i>Linking IGRT data with dose calculation for prostate IMRT planning</i> R. Jiang, R. Barnett and E. Osei	
Poster – 15	<i>Comparison of Cobalt-60 and 6 MV Linac Based Tomotherapy: A Prostate Case Study</i> S.K. Dhanesar, J. Darko, C.P. Joshi, A.T. Kerr, L.J. Schreiner	

Poster – 16	<i>Just-in-time tomography (JiTt)</i> G. Pang, J.A. Rowlands	
Poster – 17	<i>Stand alone software for deforming delivered dose distributions to account for daily anatomical variations in prostate patients treated on the TomoTherapy Hi-Art II system</i> R. Rivest, T. Riauka, A. Murtha, G. Fallone	
Poster – 18	<i>Performance Evaluation of MV CT Imaging on the HI ART II Tomotherapy Unit</i> B. Disher, S. Gaede, J.J. Battista	
Poster – 19	<i>IGRT QA for Helical Tomotherapy</i> W. Parker, M. Evans, R. Ruo, H. Patrocinio	
Poster – 20	<i>Analysis of dosimetric differences between dose-to-water vs. dose-to-medium calculations for electron beams</i> E. Gil, B. Clark, J.E. Cygler	
Poster – 21	<i>Experience with the Velocity(TM) Pre-commissioning Services</i> D. Scora, K. Sixel, D. Mason, C. Neath	
Poster – 22	<i>Image guided radiation therapy for lung cancer</i> J-P Bissonnette, T. Purdie, J. Higgins, W. Li, A. Bezjak	
Poster – 23	<i>Effect of lung density and geometry variation on inhomogeneity correction algorithms: A Monte Carlo dosimetry evaluation</i> J. Chow, M. Leung, J. Van Dyk	
Poster – 24	<i>Dosimetry study on the penumbra region for the irregular MLC fields with stepping patterns</i> J. Chow, R. Jiang, G. Grigorov	
Poster – 25	<i>Depth dependence of electron backscatter for electron radiotherapy: A Monte Carlo study</i> J. Chow, A. Owrangi	
Poster – 26	<i>Influence of MLC leaf edge and tongue and groove effect on IMRT dose distributions</i> F. Vallejo, O. Ostapiak, T. Farrell	
Poster – 27	<i>Method of estimating imaging dose to patients from on-line cone-beam computed tomography using patient size data</i> B. Schaly, E.K. Osei, R. Barnett	
Poster – 28	<i>New Brain Diffusion Analysis Method: White Matter Grey Matter Dissociation</i> A. Cárdenas-Blanco, E. Olariou, I. Cameron	
Poster – 29	<i>Real-Time Tumour Tracking and Dose Adaptation Utilizing 4D MR Images</i> J. Yun, D. Robinson, M. MacKenzie, B.G. Fallone	
Poster – 30	<i>Investigation of a patient immobilization system for breast tomotherapy</i> J.H. Strydhorst, J.-M. Caudrelier, L.A. Montgomery, B.G. Clark, M.S. MacPherson	
Poster – 31	<i>Clinical Implementation and Experience with EPID-Based Precision Isocentre Localization</i> R. Heaton, J. Smale, B. Norrlinger, Y. Wang, M. van Prooijen, M. Islam	
Poster – 32	<i>Dose errors related to the treatment couch</i> M. Niedbala, B. Nyiri, L. Gerig	
Poster – 33	<i>Initial Implementation of a Novel, Measurement-Based IMRT QA Method</i> B.M.C. McCurdy, L. Müller, E. Backman, G. Asuni, S. Venkataraman, E. Fleming, M. Jensen, F. urRehman, S. Pistorius	
Poster – 34	<i>Extended CT-range in RT planning of pelvic cancer treatment in presence of hip replacements</i> M. Popovic, O. Ostapiak and T. Chow	
Poster – 35	<i>Error reduction in variable angle implant reconstruction by optimization of imaging geometry</i> T. Meyer, I. Kay	

Poster – 36	<i>Use of Multileaf Collimator as a Replacement of Physical Missing Tissue Compensator</i> Z. Liu, O. Ostapiak, T. Farrell, T. Chow	
Poster – 37	<i>Energy and irradiation modality independence of calibration coefficients for water equivalent plastic scintillation detectors in the megavoltage range</i> M. Guillot, F. Lacroix, F. Thériault, L. Beaulieu, L. Gingras	
Poster – 38	<i>CT Imaging in High Dose Rate Brachytherapy for Treatment of Cervical Cancer: Estimation of Dose to Bowel</i> K.S. Lekx-Toniolo, R. Hunter, M. Patel, S. Voruganti, C. Johanson, K. Dhamanaskar, T. Farrell	
Poster – 39	<i>Full 3D Dose Calculation For Total Body Irradiation: A Comparison Study Between Treatment Planning Systems in Homogeneous and Heterogeneous Conditions</i> M-C. Lavallée, L. Gingras, S. Aubin, C. Côté, M. Larochelle, M. Chrétien, L. Beaulieu	
Poster – 40	<i>The potential of using SPECT ventilation information with IMRT for functional lung avoidance in radiotherapy of Non Small Cell Lung Cancer</i> I. Munawar, B. Yaremko, J. Craig, J. Chen, M. Oliver, S. Gaede, G. Rodrigues, E. Yu, R. Reid, E. Leung, E. Wong	
Poster – 41	<i>Imaging and radiation delivery in helical tomotherapy: Phantom study of a moving target</i> C. Gallagher, S. Yartsev, J. Van Dyk	
Poster – 42	<i>A Revision of the γ-Evaluation: Initial Interpretation of Dose Disagreements on γ-Vector Fields</i> O. Holmes, J. Darko, S. Dhanesar, T. Olding, and L.J. Schreiner	
Poster – 43	<i>Verification of Dose Calculation with Tissue Inhomogeneity Using MapCHECK</i> R. Korol, J. Chen, H. Mosalaei, S. Karnas	

FRIDAY, JUNE 27, 2008

J.R. CUNNINGHAM YOUNG INVESTIGATORS SYMPOSIUM

Grand Salon, Pav Desjardins, Université Laval

8:30 – 10:30 a.m.

Chairs / Présidents: **J.R. Cunningham**, Emeritus and **Jean-Pierre Bissonnette**, Princess Margaret Hospital – UHN, Toronto, Ontario

8:30 a.m.	Sci-Fri YIS-01	<i>Comprehensive MR Distortion Correction: Phantom Validation and In-vivo Application</i> L.N. Baldwin, K. Wachowicz, B.G. Fallone	
8:42 a.m.	Sci-Fri YIS-02	<i>Evaluation of the LabPET4 Imaging Capabilities for in vivo Small Animal Imaging</i> M. Bergeron, J. Cadorette, M-A Tétrault, N. Viscogliosi, J-F Beaudoin, V. Selivanov, R. Fontaine, R. Lecomte	
8:54 a.m.	Sci-Fri YIS-03	<i>Simulated annealing optimization of the pre-target electron beam in Monte Carlo virtual linac models</i> K. Bush, S. Zavgorodni, W. Beckham	
9:06 a.m.	Sci-Fri YIS-04	<i>Scatter Correction of Cone Beam Optical Computed Tomography for Polymer Gel Dosimetry</i> O. Holmes, T. Olding, and L. J. Schreiner	
9:18 a.m.	Sci-Fri YIS-05	<i>A New Guidance Device for Lateral-Approach Stereotactic Breast Biopsy</i> K. Ma, J. Bax, A. Kornecki, Y. Mund, A. Fenster	
9:30 a.m.	Sci-Fri YIS-06	<i>On-line adaptive radiation therapy based on the intra-fractional digital tomosynthesis images</i> A. Mestrovic, A. Nichol, B. Clark, K. Otto	
9:42 a.m.	Sci-Fri YIS-07	<i>A New Paradigm for Improving IMRT: Selection of Beam Orientations by Optimizing Beam Intersection Volume</i> P. Potrebko, B. McCurdy	
9:54 a.m.	Sci-Fri YIS-08	<i>Prototype Fan Beam Optical Computed Tomography Scanner for Three-Dimensional Dose Verification in Radiation Therapy</i> D. Rudko, D. Wells and A. Jirasek	
10:06 a.m.	Sci-Fri YIS-09	<i>The Effect of Magnetic Interference on a Coupled MR-Linac system: Optimization of 3D FEM Linac Model</i> J. St. Aubin, S. Steciw, M. Carlone, B.G. Fallone	
10:18 a.m.	Sci-Fri YIS-10	<i>Development of a Flat Panel Detector with Avalanche Gain for Low-Dose X-Ray Imaging</i> M.M. Wronski, A. Reznik, J.A. Rowlands, W. Zhao, J.A. Segui	

COFFEE BREAK
EXHIBITS OPEN

Location

SPECIAL LECTURE

TBD

GOLD MEDAL PRESENTATION

Grand Salon, Pav Desjardins, Université Laval

11:00 a.m. – noon.

LUNCH BREAK
EXHIBITS OPEN

Location

SCIENTIFIC SESSION

Radiation Therapy Tx Planning & Dosimetry

Grand Salon, Pav Desjardins, Université Laval

1:45 – 3:45 p.m.

Chair / Président: **Luc Gingras**, CHUQ – Hôtel-Dieu de Québec

1:45 p.m.	Sci-Fri PM-01	Measured electron and x-ray angular distribution data for benchmarking Monte Carlo codes C.D. Cojocaru, C.K. Ross, M.R. McEwen, A.F. McDonald, and B.A. Faddegon	
1:55 p.m.	Sci-Fri PM-02	MRI-based radiation treatment planning for an MRI-Linac system T. Stanescu, C. Kirkby, H. Jans, K. Wachowicz, S. Rathee, M. Carlone, B. Murray, G. Fallone	
2:05 p.m.	Sci-Fri PM-03	Fundamental understanding of the inter-relation of arc range, angular dose rate and MLC leaf position optimization of Intensity Modulated Arc Therapy for a concave target M. Oliver, J. Chen, E. Wong	
2:15 p.m.	Sci-Fri PM-04	Dose escalation study using anatomy-based aperture IMRT and SPECT perfusion images for lung cancer J. St-Hilaire, C. Lavoie, F. Beaulieu, A. Dagnault, F. Morin, L. Gingras, D. Tremblay, and L. Beaulieu	
2:25 p.m.	Sci-Fri PM-05	Saving Trees and Improving Workflow C. Angers, J. Renaud, M. MacPherson, B. Clark	
2:35 p.m.	Sci-Fri PM-06	Verification of a Monte Carlo based treatment planning system in a homogeneous water phantom O. Nairz, J. Cygler, B. Clark	
2:45 p.m.	Sci-Fri PM-07	A Low Diffusion Radiochromic Gel Dosimeter For Three-Dimensional Radiation Dosimetry S. Babic, J. Battista, K. Jordan	
2:55 p.m.	Sci-Fri PM-08	Zero Diffusion Radiochromic Genipin-Gelatin Dosimeter K. Jordan	
3:05 p.m.	Sci-Fri PM-09	An EGSnrc investigation of ion chamber response to Co-60 beams D. J. La Russa, D.W.O. Rogers	
3:15 p.m.	Sci-Fri PM-10	The replacement correction factors for cylindrical chambers in mega-voltage beams L. Wang, D.W.O. Rogers	

3:25 p.m.	Sci-Fri PM-11	<i>Selection and Optimization of Angiographic Roadmap Images for Magnetic Resonance Guided Catheter Tracking</i> H.S. Chen, J.N. Draper, L.B. Andersen, M. Sabati and R. Frayne	
3:35 p.m.	Sci-Fri PM-12	<i>Class II division interpretation of the amended Class II regulations</i> J. Plante	

COFFEE BREAK EXHIBITS OPEN	Location
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COMP ANNUAL GENERAL MEETING
Grand Salon, Pav Desjardins, Université Laval
4:30 – 6:00 p.m.

BANQUET Musée des Beaux-Arts	Location
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SATURDAY, JUNE 28, 2008

SCIENTIFIC SESSION

Diagnostic Imaging & Nuclear Medicine

Grand Salon, Pav Desjardins, Université Laval

8:30 – 10:00 a.m.

Chair / Président: **Prof. René Roy**, Université Laval

8:30 a.m.	Sci-Sat AM(1)–01	<i>Hyperpolarized 3He Lung Imaging using 3D Cones K-space Traversal</i> J-X Wang, J.A. Stainsby, M. Fox, A. Ouriadov, W.W. Lam, G.E. Santyr	
8:40 a.m.	Sci-Sat AM(1)–02	<i>Comparison between experimental measurements and Monte Carlo simulations for the off-focal radiation in diagnostic x-ray systems</i> E.S.M. Ali, D.W.O. Rogers	
8:50 a.m.	Sci-Sat AM(1)–03	<i>On-line Dynamic Contrast Enhanced Cone-Beam CT for Measuring</i> Q. Tang, S. Kim, R. Clarkson, Y.-B. Cho, D. Moseley, I. Yeung	
9:00 a.m.	Sci-Sat AM(1)–04	<i>Respiratory Errors in Cardiac PET/CT with Manual Alignment of the CT Image</i> R.G. Wells	
9:10 a.m.	Sci-Sat AM(1)–05	<i>Tumour and Normal Tissue T2 and ADC Distributions for a Mouse Model at 9.4T</i> M. Larocque, A. Syme, B.G. Fallone	
9:20 a.m.	Sci-Sat AM(1)–06	<i>Analytical scatter estimation for cone-beam computed tomography</i> H. Ingleby, I. Elbakri, D. Rickey and S. Pistorius	
9:30 a.m.	Sci-Sat AM(1)–07	<i>Proximity-based modification to an automatic method for tumor delineation using MRSI</i> A.A. Heikal, K. Wachowicz, B.G. Fallone	
9:40 a.m.	Sci-Sat AM(1)–08	<i>Open field normalization: How to avoid inflation to MTF and DQE values caused by zero-frequency normalization</i> S.N. Friedman, I.A. Cunningham	
9:50 a.m.	Sci-Sat AM(1)–09	<i>Small Animal APD PET Detector with Submillimetric Resolution for Molecular Imaging</i> P. Bérard, M. Bergeron, C.M. Pepin, J. Cadorette, M-A Tétrault, N. Viscogliosi, R. Fontaine, H. Dautet, M. Davies, R. Lecomte	

COFFEE BREAK EXHIBITS OPEN	Location
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SCIENTIFIC SESSION

Brachytherapy

Grand Salon, Pav Desjardins, Université Laval

10:30 a.m. – noon.

Chair / Président: **Luc Beaulieu**, CHUQ – Hôtel-Dieu de Québec

10:30 a.m.	Sci-Sat AM(2)–01	<i>A Novel HDR Ir-192 Brachytherapy Water Calorimeter Standard</i> A. Sarfehnia, J. Seuntjens	
10:40 a.m.	Sci-Sat AM(2)–02	<i>Image guided brachytherapy (IGBT) for HDR Prostate treatment : Pre-treatment verification using cone beam imaging to determine catheter displacement</i> R. Holly, R. Sankrecha, G. Morton	
10:50 a.m.	Sci-Sat AM(2)–03	<i>Monte Carlo dosimetry for I-125 and Pd-103 eye plaque brachytherapy</i> R.M. Thomson, R.E.P. Taylor, D.W.O. Rogers	
11:00 a.m.	Sci-Sat AM(2)–04	<i>Spectral and Dosimetric study of the Xofigo Electronic Brachytherapy System</i> D. Liu, B. Reniers, E. Poon, M. Bazalova, T. Rusch, F. Verhaegen	
11:10 a.m.	Sci-Sat AM(2)–05	<i>Dosimetry effects of the TG-43 approximations for two iodine seeds in LDR brachytherapy</i> C. Furstoss, M.J. Bertrand, E. Poon, B. Reniers, JP. Pignol, JF. Carrier, L. Beaulieu, F. Verhaegen	
11:20 a.m.	Sci-Sat AM(2)–06	<i>A Comparison Of MR/CT Fusion Versus CT Alone For Assessment Of Implant Quality In Permanent Prostate Brachytherapy</i> D. K. Sasaki, K. Malkoske, J. Bews, P. Cho, D. Drachenberg, A. Chowdhury	
11:30 a.m.	Sci-Sat AM(2)–07	<i>Tomosynthesis-based seed reconstruction in LDR prostate brachytherapy: a clinical study</i> M. Brunet-Benkhoucha, F. Verhaegen, S. Lassalle, D. Béliveau-Nadeau, B. Reniers, D. Donath, D. Taussky, J-F. Carrier	
11:40 a.m.	Sci-Sat AM(2)–08	<i>Monte Carlo calculations of 192Ir high dose rate brachytherapy treatment plans using CT and cone beam CT images</i> E. Poon, F. Verhaegen	
11:50 a.m.	Sci-Sat AM(2)–09	<i>Investigation of catheter displacement in HDR prostate brachytherapy</i> D.C. Hunt, H. Soliman, R. Sankrecha, G. Morton	

OFFICIAL CLOSING

12:00 noon