



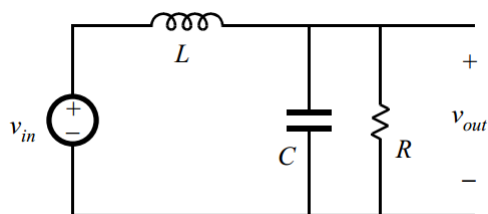
High Frequency Power Electronics

Prof. Daniel Costinett

ECE 581 Lecture 3
August 25, 2014

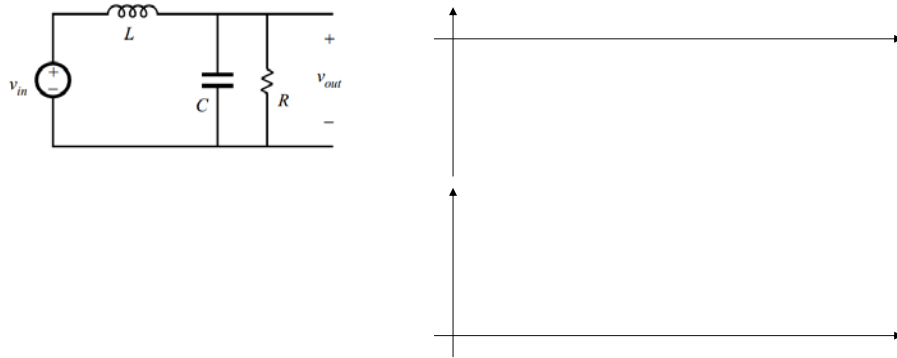


Resonant Circuits

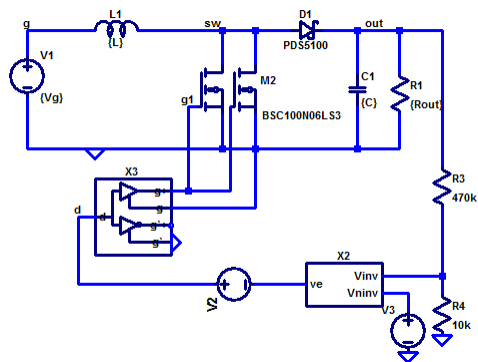


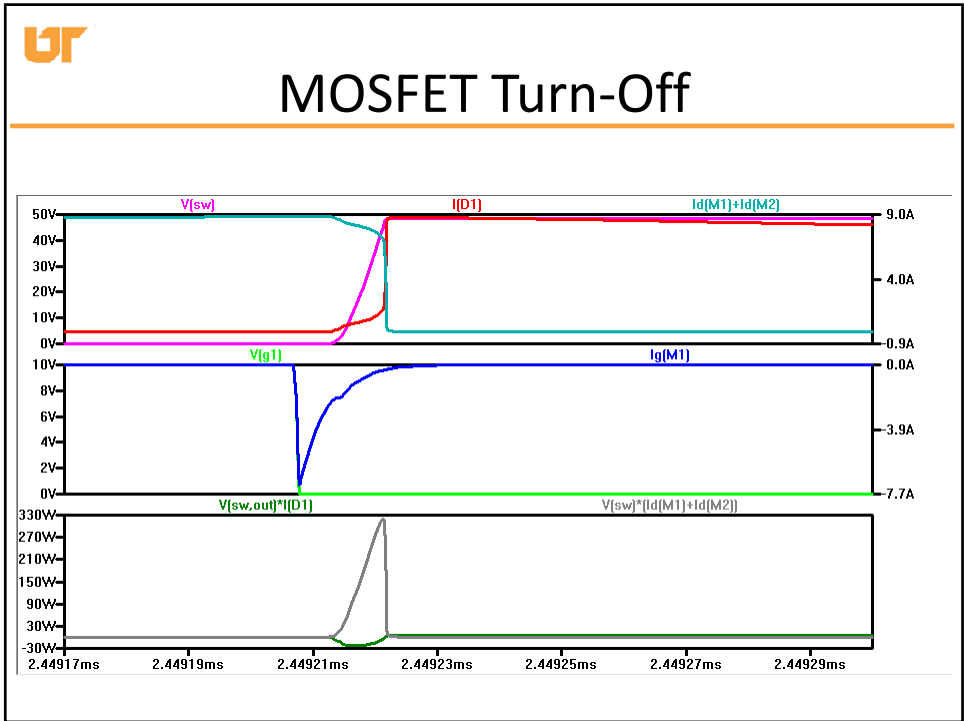
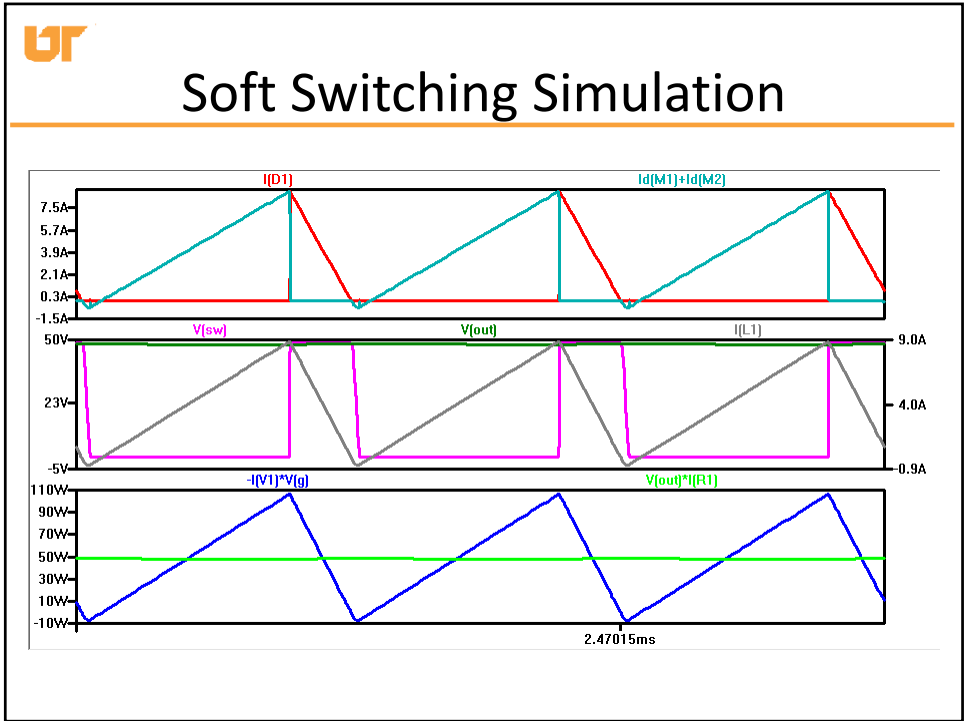


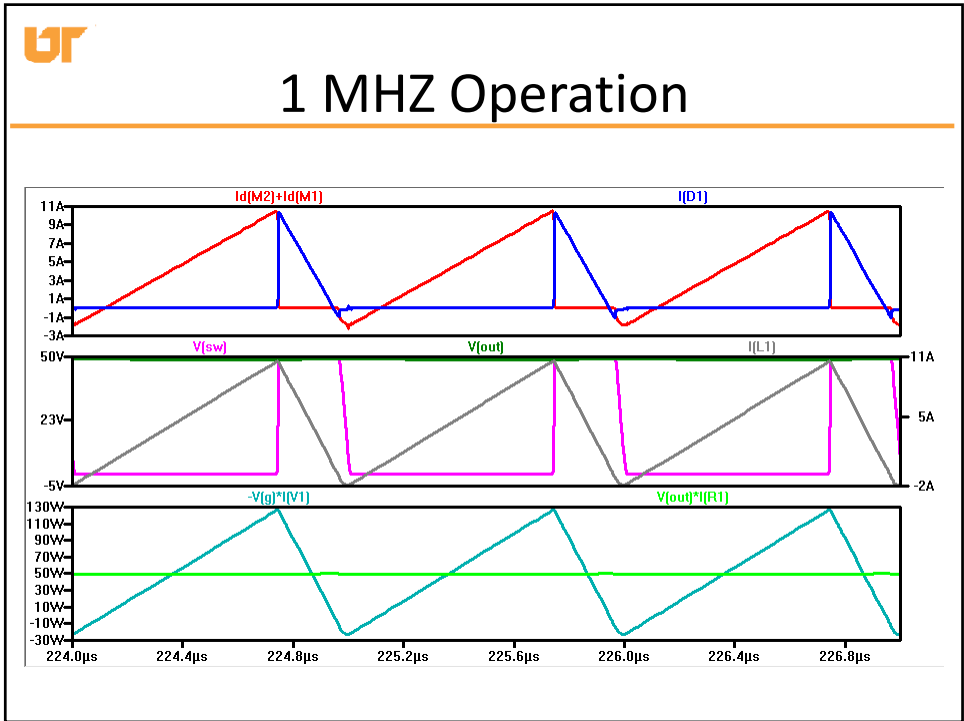
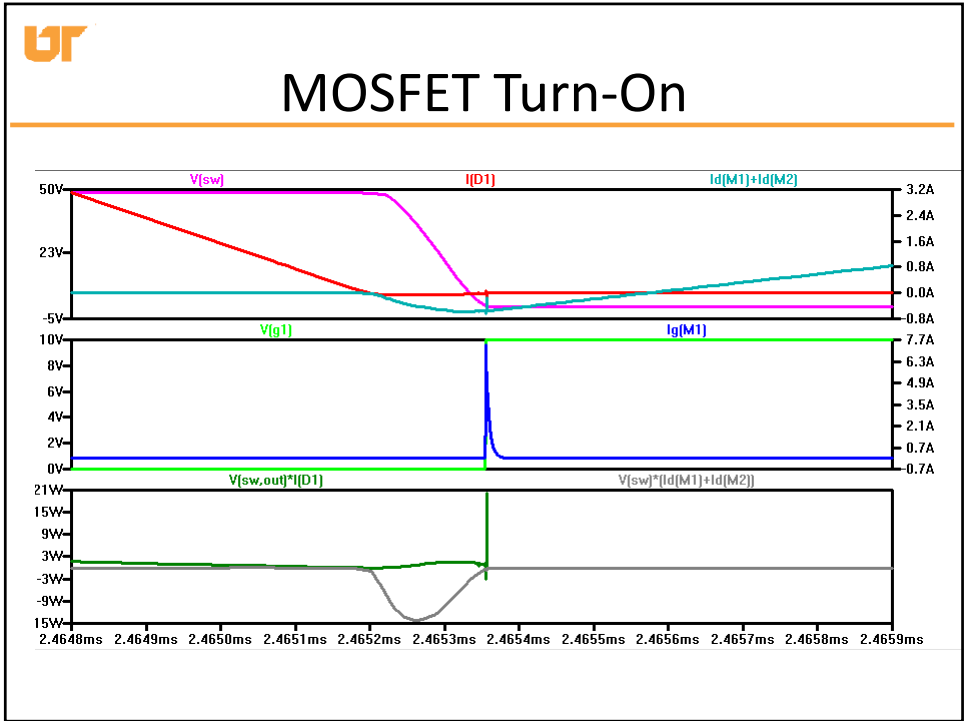
Resonant Circuit Analysis

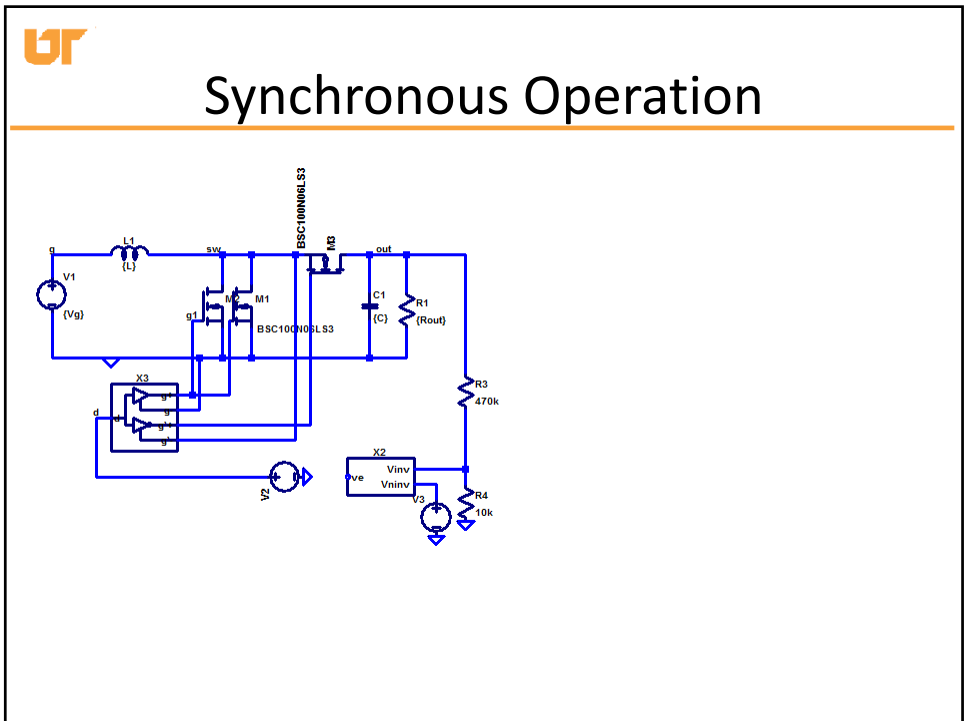
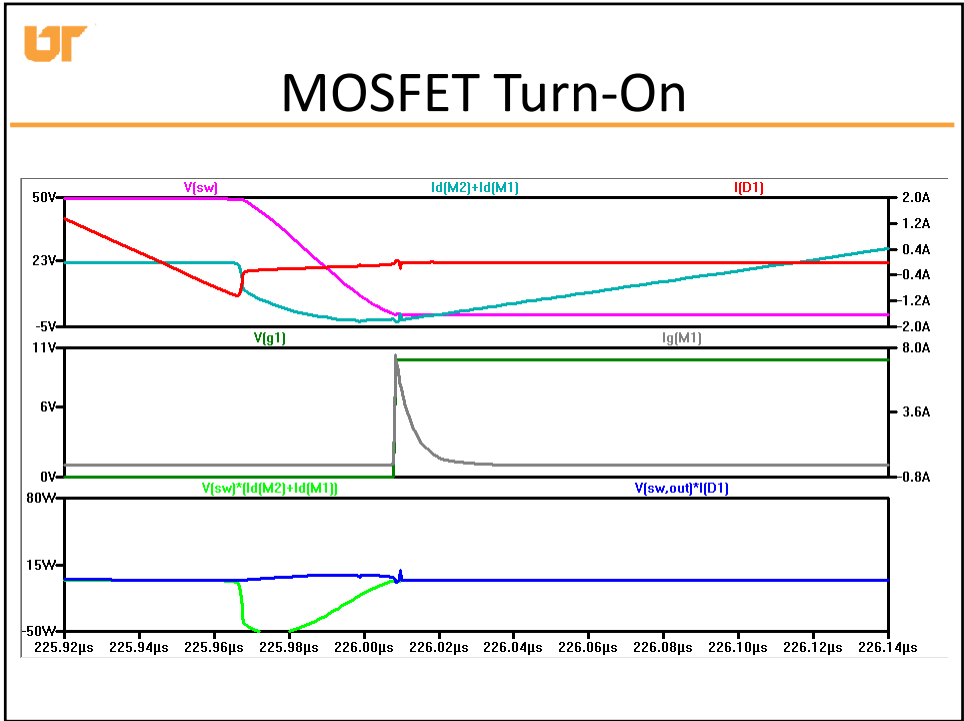


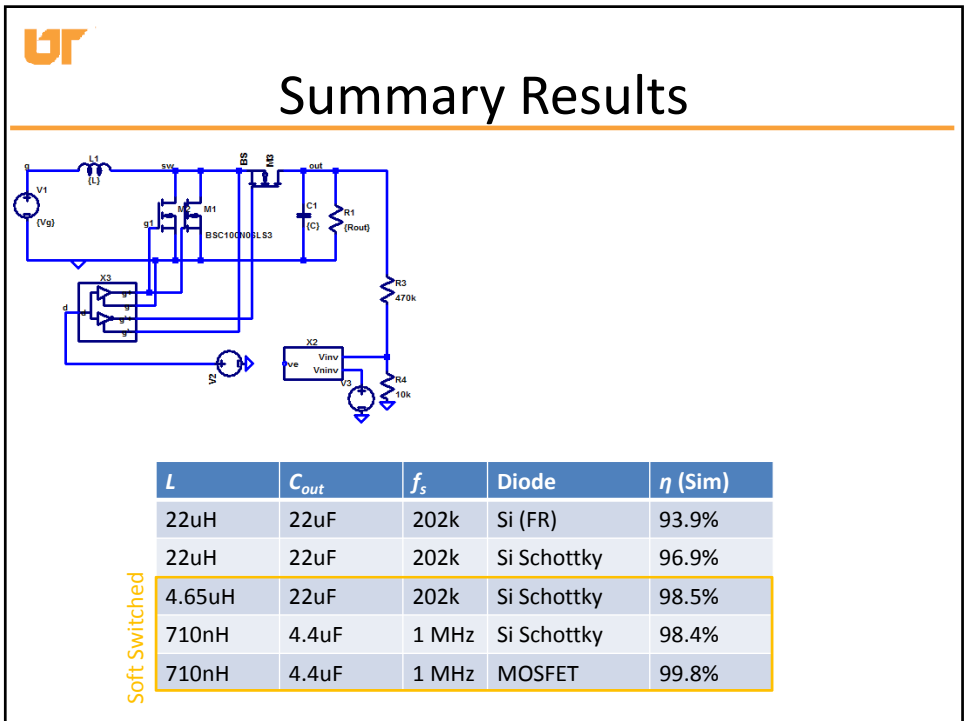
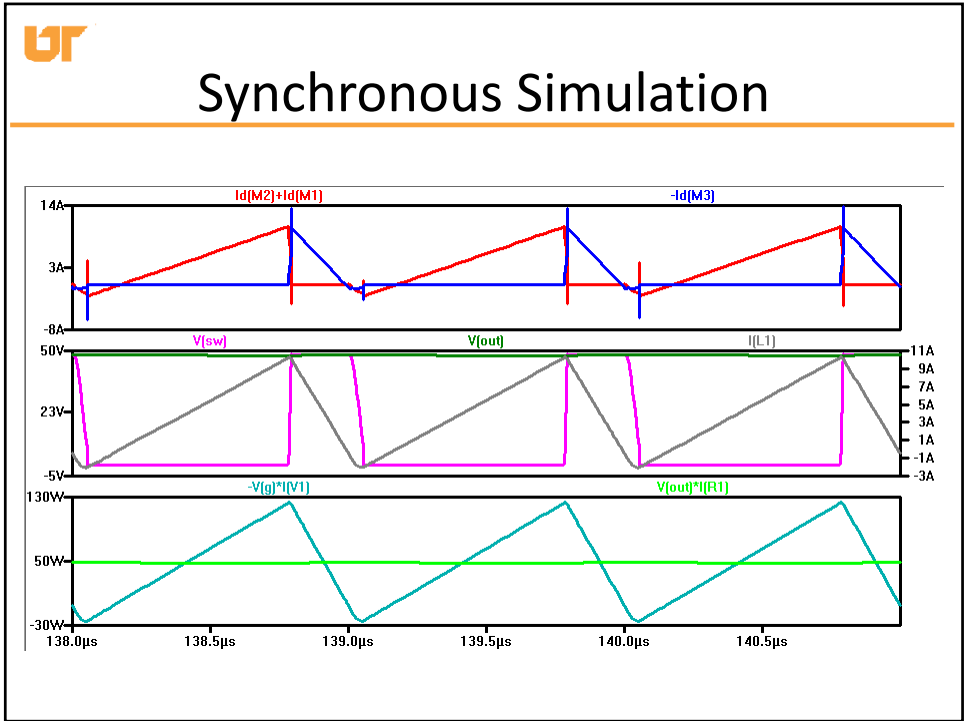
Soft Switching





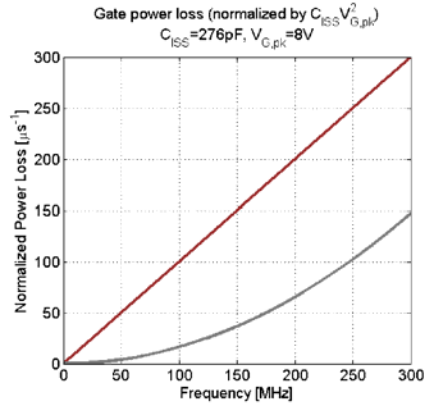
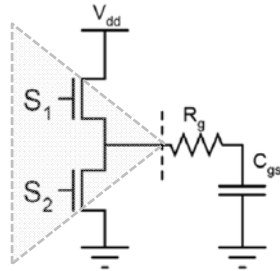




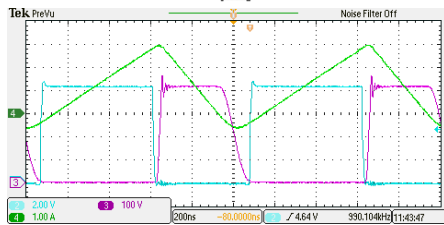
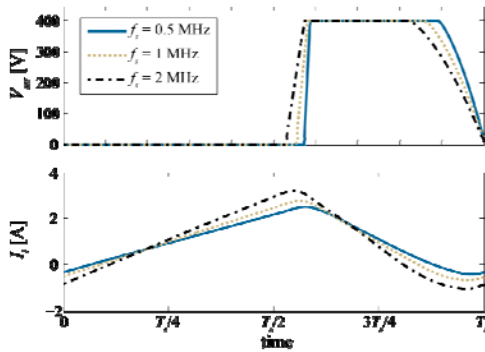




Limitations: Gate Drive

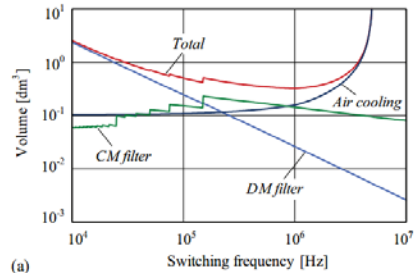


Limitations: t_d/T_s

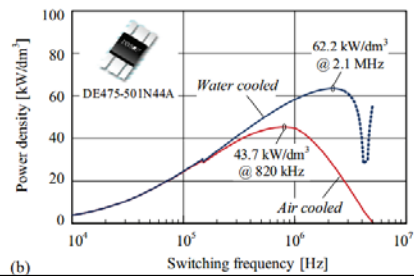




Limitations: Thermal



(a)

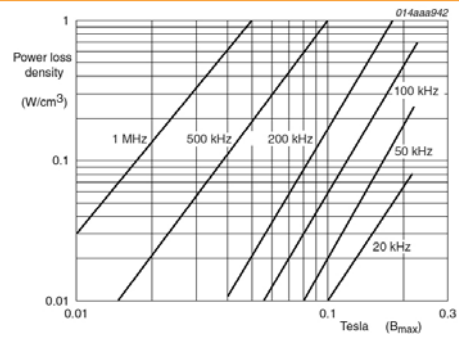
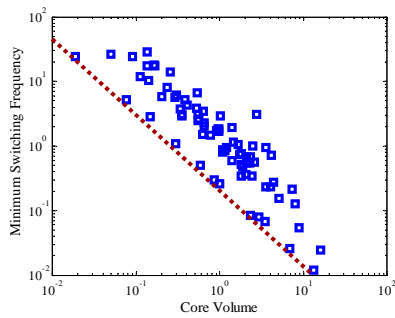


(b)

Kolar, J.W.; Drofenik, U.; Biela, J.; Heldwein, M.L.; Ertl, H.; Friedli, T.; Round, S.D., "PWM Converter Power Density Barriers," *Power Conversion Conference - Nagoya, 2007. PCC '07*, vol., no., pp.P-9,P-29, 2-5 April 2007

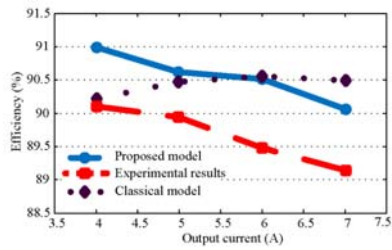
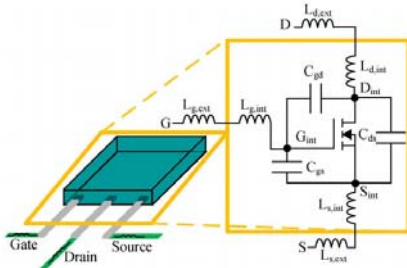


Limitations: Magnetics Design





Limitations: Circuit Modeling



Rodríguez, M.; Rodríguez, A; Miaja, P.F.; Lamar, D.G.; Zúñiga, J.S., "An Insight into the Switching Process of Power MOSFETS: An Improved Analytical Losses Model," *Power Electronics, IEEE Transactions on*, vol.25, no.6, pp.1626,1640, June 2010