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Student Excellence Award Finalist: Ion Flux and Energy Measurement at a Pulsed Biased Electrode in a C_2H_2:Argon Inductively Coupled Plasma During DLC Growth. A. BABY, C.M.O. MAHONY, P.D. MAGUIRE, Nanotechnology and Integrated BioEngineering Centre, University of Ulster — Diamond-like carbon is an important material for biomedical and mechanical applications. Knowledge of growth mechanisms is severely limited by lack of basic hydrocarbon plasma data since measurement is extremely challenging due mainly to probe deposits. Plasma models suffer from a lack of basic information e.g. T_e, n_e. We measured ion energy distributions and neutral fluxes for six dominant species directly at the growing substrate in a C_2H_2:Argon ICP ($\leq$10mTorr) for the first time. By RF pulse biasing the substrate electrode we have also determined the absolute values of positive ion flux[1]. From analysis of bimodal IEDs and 1D modelling of multi-species ion transport across the sheath, we intend to extract plasma density. This requires internal probe measurement to confirm model estimates of n_e and T_e. Pulsed bias generates a central peaked trimodal IED from which we can better isolate the impact of ion energy during our DLC growth. We estimate dissociation kinetics from infrared TDLAS and neutral flux measurement. Correlation of film properties with growing substrate fluxes will be a first for this important material and will be an critical input to current rudimentary growth models. [1] Braithwaite et.al. Plasma Source Sci Technol. **5** (1996) 6

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[X] Prefer Oral Session
[ ] Prefer Poster Session

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