Wake characteristics of a model ornithopter

ALFREDO JUAREZ, New Mexico State University, JACOB HARLOW, New Mexico State University, JAMES ALLEN, New Mexico State University, PAULO FERREIRA DE SOUSA — This paper details unsteady wake measurements from a model Ornithopter flying in a wind tunnel at representative flight conditions. Testing over a range of Strouhal number, 0.1-0.3, shows that the unsteady wake is composed of coherent vortical structures that resemble vortex rings. A single ring is formed in the wake of each wing during one wing beat. Momentum balance from velocity field measurements are reconciled with unsteady lift and drag measurements from a drag balance.