1086-86-2624 **Jin Sun*** (jin@coas.oregonstate.edu), 104 CEOAS Admin Building, Oregon State University, Corvallis, OR 97330, **Gary D Egbert** (egbert@coas.oregonstate.edu), 104 CEOAS Admin Building, Oregon State University, Corvallis, OR 97330, and **Anna Kelbert** (anya@coas.oregonstate.edu), 104 CEOAS Admin Building, Oregon State University, Corvallis, OR 97330. *Explicit current source modeling in global geomagnetic induction: forward and inverse problems.*

Global geomagnetic induction studies Earth's induction response to external current sources and make inferences about the deep conductivity structures of the solid Earth. Modeling of the external current sources has long relied on Gaussian coefficients, which obscure relationships between the true physical currents and the equivalent representations. Using representations based on Green's functions, such relationships may be clarified. Separation of internal, external and radial current sources is explicitly obtained. Inadequate source modeling has long plagued global induction: With a highly simplified P10 dipole model, geomagnetic data are limited in period, latitude and space weather conditions where such model may be tenable. To overcome these limitations, we propose a simultaneous source-conductivity estimation: Our approach involves 1) principal component analysis of observatory data to extract dominating spatial variation modes at periods from 2 to 100 days; 2) source modeling and estimation from the data spatial modes, using explicit currents under quasi-dipole coordinates; and 3) 3D conductivity anomaly estimation with fixed sources. The two estimation procedures are iterated to explore the trade-offs between conductivity anomalies and source complications. (Received September 25, 2012)