1048-34-91   **Elizabeth L Mansfield*** (`e.l.mansfield@kent.ac.uk`), IMSAS, University of Kent, Canterbury, CT2 7NF, England. *Moving frames and Noether's Theorem.* Preliminary report.

The reformulation of the concept of moving frames by Fels and Olver allows it to apply to many classes of equivalence problems that do not necessarily arise in differential geometry. Suppose that a Lie group G acts smoothly on some smooth space M. A moving frame is defined to be an equivariant map $\rho : M \to G$. The equivariance, together with a straightforward use of multivariable calculus, allows for a plethora of results concerning the symbolic manipulation of invariants to be obtained.

Recently the author obtained a method that yields the Euler Lagrange equations of a Lagrangian which is invariant under a Lie group action, directly in terms of the invariants, but using only the symbolic invariant calculus. This complements work by Kogan and Olver who used a trivariational complex to solve the same problem.

As a by product of the speaker's method, the conservation laws yielded by Noether's Theorem can be written down in terms of a particular matrix representation of the frame and a vector of invariants.

The result presented is joint work with Tania Gonçalves (University of Kent, UK). Recent results due to Hubert on obtaining generating sets of syzygies of differential invariants will play a role in turning template calculations into theorems. (Received January 28, 2009)