1086-65-1632 **Leszek Demkowicz**, **Jay Gopalakrishnan*** (gjay@pdx.edu) and **Joachim Schoeberl**.
Polynomial extension operators.

We constructively prove the existence of polynomial extension operators in three fundamental Sobolev spaces on a tetrahedron. To describe the result in the Sobolev space H(div), suppose w is a function on the boundary of a tetrahedron such that it is a polynomial of degree at most p on each face. Then, we construct an operator E such that (i) Ew is a vector function whose components are polynomials of at most the same degree p in the tetrahedron, (ii) Ew an extension of w in the sense that the trace of the normal component of Ew on the boundary of the tetrahedron coincides with w, and (iii) E extends to a continuous operator from a natural trace space into H(div). Similar results hold for the other two Sobolev spaces (namely H(grad) and H(curl)) that completes a well-known exact sequence. (Received September 23, 2012)