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Uri Andrews, Mingzhong Cai* (mcai@math.wisc.edu), **David Diamondstone, Steffen Lempp** and **Joseph S. Miller**. *Degrees of Provability*. Preliminary report.

Given two recursive functions f and g (with fixed algorithms), we say f is provably reducible to g if the totality of g proves the totality of f over some fixed base theory (for example, Peano Arithmetic). We study the induced degree structure on the recursive functions, i.e., all total recursive functions modulo provable equivalence. This is essentially the Lindenbaum algebra restricted on true Π_2^0 sentences. We use ideas and methods from classical recursion theory to study this proof-theoretic degree structure. In addition to the induced order relation, there are two natural jump-like operators in the degrees. Sample theorems include density theorem, diamond theorem, jump inversion theorem and high/low hierarchy. (Received March 03, 2013)