

We consider nonparametric estimation of the regression function in a nonlinear regression model where the regressor is a nonstationary unit root process and the error  $\varepsilon_t$  is a sequence of independent and identically distributed (i.i.d.) random variables. With proper centring and scaling, the maximum deviation of the local linear estimator of the regression function is shown to be asymptotically Gumbel. Based on the latter result, we construct simultaneous confidence bands, which can be used to test patterns of the regression function. Our results substantially extend existing ones which typically require independent or stationary weakly dependent regressors. Furthermore, we provide a simulation study to illustrate the finite sample behavior of the proposed approach.