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1006-62-249 **Ali Khoujmane*** (`akhoujma@math.ttu.edu`), Texas Tech University, Mathematics and Statistics Department, Box 41042, Lubbock, TX 79409, **Frits Ruymgaart** (`rymg@math.ttu.edu`), Texas Tech University, Mathematics and Statistics Department, Box 41042, Lubbock, TX 79409, and **Victor Patrangenaru** (`vpatrang@math.ttu.edu`), Texas Tech University, Mathematics and Statistics Department, Box 41042, Lubbock, 79409. *On improving input estimators with potential applications to Positron Emission Tomography.*

Preliminary report In this paper a procedure will be discussed to improve the usual estimator of a linear functional of the unknown regression function (input) in inverse nonparametric regression models (input-output systems). Although the traditional estimator is not asymptotically efficient in the sense of the Hjek-LeCam convolution theorem, it is still root-n consistent so that a procedure by Bickel et al. (1993) applies to construct an asymptotically efficient modification. In this way the traditional estimators of the Fourier coefficients of the unknown input are modified, which subsequently leads to an improved estimator of the entire input function. A possible application to PET-imaging is briefly discussed. References: [C] Cavalier, Laurent Efficient estimation of a density in a problem of tomography. Ann. Statist. 28 (2000), no. 2, 630–647. [GS] Goldenshluger, A.; Spokoiny, V. On the shape-from-moments problem and recovering edges from noisy Radon data. Probab. Theory Related Fields 128 (2004), no. 1, 123–140. [JS] Johnstone, Iain M.; Silverman, Bernard W. Speed of estimation in positron emission tomography and related inverse problems. Ann. Statist. 18 (1990), no. 1, 251–280 [K] Khoujmane, A., Ruymgaart, Frits H.:in preparation (Received February 15, 2005)