

Empirical Spectral Density of singular values of random band matrices; Marchenko-Pastur law and more

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We consider the limiting spectral distribution of matrices of the form  $(R + X)(R + X)^*/(2b_n + 1)$ , where  $X$  is an  $n \times n$  band matrix of bandwidth  $b_n$  and  $R$  is a non random band matrix of bandwidth  $b_n$ . We show that the Stieltjes transform of spectrum of such matrices converges to the Stieltjes transform of a non-random measure, and the limiting Stieltjes transform satisfies an integral equation. For  $R = 0$ , the integral equation yields the Stieltjes transform of the Marchenko-Pastur law. This is a joint work with Indrajit Jana.