1152-35-30 **Lei Zhang***, 1400 Stadium Rd, Gainesville, FL 32611, and **Yi Gu**. *Degree counting theorems for singular Liouville systems.* Preliminary report.

Let (M,g) be a compact Riemann surface with no boundary and $u=(u_1,...,u_n)$ be a solution of the following singular Liouville system:

$$\Delta_g u_i+\sum_{j=1}^n a_{ij}\rho_j(\frac{h_je^{u_j}}{\int_M h_je^{u_j}dV_g}-\frac{1}{vol_g(M)})=\sum_{t=1}^N 4\pi\gamma_t(\delta_{p_t}-\frac{1}{vol_g(M)}),$$

where $i=1,...,n$, $h_1,...,h_n$ are positive smooth functions, $p_1,...,p_N$ are distinct points on M, δ_{p_t} are Dirac masses, $\rho=(\rho_1,...,\rho_n)$ $(\rho_i\geq 0)$ and $(\gamma_1,...,\gamma_N)$ $(\gamma_t>-1\ )$ are constant vectors. If the coefficient matrix $A=(a_{ij})_{n\times n}$ satisfies standard assumptions we identify a family of critical hyper-surfaces Γ_k for $\rho=(\rho_1,..,\rho_n)$ so that a priori estimate of u holds if ρ is not on any of the Γ_ks. Thanks to the a priori estimate, a topological degree for u is well defined for ρ staying between every two consecutive Γ_ks. In this article we establish this degree counting formula which depends only on the Euler Characteristic of M and the location of ρ.This is a joint work with Yi Gu. (Received August 06, 2019)