2D Bose gases near resonance

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We explore 2D Bose gases at large scattering lengths near resonance by analyzing contributions of 3-body scattering events that are universal in 2D unlike the 3D case of Efimov physics dependant upon ultraviolet limit energy scale. Within our approach, we study competition between 2-body and 3-body forces for varying scattering length parameter beyond the dilute limit, and find that, as the role of 3-body processes becomes significant, chemical potential saturates and reaches maximum at the first critical value beyond which we get region of negative compressibility. For even larger scattering lengths the 3-body forces become dominant and eventually lead to the onset of instability at the second critical value.