SOLITARY WAVES FOR POWER DEGENERATE NLS - EXISTENCE AND STABILITY

We consider an NLS equaiton of the form

$$iu_t + \nabla \cdot (|x|^{2a} \nabla u) + |u|^{p-1} u = 0$$

We construct its solitary waves as minimizers of the relevant Caffarelli-Kohn-Nirenberg's inequality for the optimal set of parameters (i.e. those not explicitly forbidden by the Pohozhaev's identities). We present a complete classification of their spectral stability, as solutions to the time dependent problem. Finally, we use virial's identities and the Ohta's method to establish instability-by-blowup results for the spectrally unstable waves.