# Spectral properties of perturbations of complex harmonic oscillators

**G. Tranquilli**
Dipartimento di Matematica ed Informatica,
Via Ospedale 72, Cagliari, Italy
tranquilli@unica.it

We investigate the spectral properties of a secondon order Shubin type differential operator. The main tool is the reduction to global normal forms.

In particular, we are able to describe completely the spectrum of the following model (normal form) non–self–operator on the real line

$$Pu = -u''(x) + (\varepsilon x + p)u' + \omega x^2 + iqx, \quad \varepsilon, p, q \in, \omega \in R,$$

which might be viewed as a perturbation of the complex harmonic oscillator studied by E.B. Davies and A.B.J Kuijlaars (2004).
The functional frame of our investigations (in addition to the Schwartz class $S(R)$ and the weighted Sobolev (Shubin)) is formed by the scale of the Gelfand–Shilov spaces $S^{\nu}_{\nu}(R)$, $\mu + \nu \geq 1$.

*The talk is based on joint work with T. Gramchev (Università di Cagliari).*