where p(r,t) is the sum of the radiated acoustic and hydrostatic pressures. A=3.040763 x 10^8 N m^{-2} or 3001 atmospheres, $B = A - P_0$, and

$$G(R,t) = R(t)(H(R,t) + \frac{U(t)^2}{2}), \tag{10}$$

Fig.3 shows the results of calculations carried out on a bubble of resonant size (80.64 μm) at 40kHz using various forcing pressure amplitudes. As indicated in the fig.3 caption, radiated acoustic pressures were evaluated at a distance of 0.4 mm from the bubble center using (10), following the solution of (2).

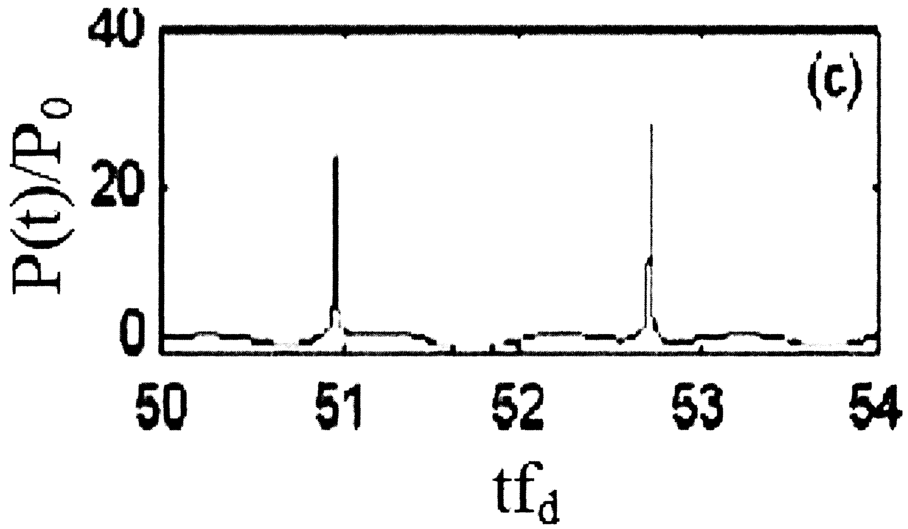

FIGURE 3. Radiated acoustic pressure vs Time

The reasons for this increase in the broadband signal level have been considered by Ilyichev [6]; and, in addition to the strong shocks generated in the time- domain waveform, some of the solutions to the bubble motion are strongly chaotic, behaviour typical of a non-linear systems of higher order [2].

3. HOS methods for propeller cavitation assessment

The HOS methods were initially used for understanding of the non-linearity in many branches of engineering such as electrical sciences, resulting in several useful non-linear spectral tools. In this paper, HOS tools are proposed to understand propeller cavitation noise. The auto-bicoherence and cross-bicoherence are non-linear analogous