Dolphin assisted therapy involves dolphins because of their purported therapeutic properties. The physiological effect of dolphin contact on human beings is characterised by noticeable modifications in brain electrical activity. The actual mechanism of action is still unclear. Through analysis of dolphin sonar signals, and comparison with mechanical resonance frequencies of the human body, a possible mechanism of action becomes apparent and is presented here.

**INTRODUCTION**

Dolphin assisted therapy is a growing area of interest to the general public, with reports of pain relief, extinction of depression and improved learning in autistic children. People subjected to exposure display modifications of brainwave activity involving an increase of synchronised high power slow wave activity. A cerebral hormonal mechanism involving Pro-opiomelanocortin derivates has been postulated and electro-physiological evidence in support of the underlying endorphin mechanism collected and presented elsewhere [1].

**METHOD**

Dolphin biosonar echolocation signals were recorded from in field dolphin-human interactions and pulse interval measurements obtained. These were analysed using Canary 1.2 Bioacoustics Research software [2]. Values for pulse interval times were found to correspond to generalised dolphin search pattern characteristics [3] so the general case scenarios are presented here.

Calculations of the power generated by dolphin ultrasonic signals suggest that dolphins are capable of generating a reasonably high power signal, in the order of 8.3 W/cm² [4].}

**DISCUSSION**

It has been proposed that the lung volumes of whales can act as resonating bubbles [5], and applying Andreeva’s formula [6] to the case of human lung volumes [7] is an easy next step. Such calculations have been made for lung volumes ranging from 1 to 6 litres, at depths up to 10 m.

Comparing these values shows that expected frequencies resulting from dolphin sonar investigation fall within the range of calculated lung resonance frequencies.
The effect of tissue non-linearity in the transmission of ultrasound should be taken into account, as at higher ultrasonic frequencies, there is the generation of 2nd and 3rd harmonics which can be only 10-20dB less than the fundamental. [12]. It has been theoretically shown that acoustic shocks may occur in body fluids in unfocused fields using pressure levels encountered clinically [13]. Thus, harmonics or sub harmonics of the mechanical resonant frequencies may be attained during dolphin ensonification.

It is also proposed that the biosonar signal, pulsed at these low frequencies may result in activation of piezoelectric collagen molecules within the body and generate a whole body electric field pulsation which may lead to whole body entrainment of the receptive nervous system. Such a mechanism could result in entrainment of the brain to produce specific low frequency components in conjunction with the previous mechanism, as well as the changes which result from increased endorphin production.

REFERENCES