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Excessive correlated shifts in pH within distal solutions sharing phase-uncoupled angular accelerating magnetic fields: Macro-entanglement and information transfer

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Entanglement or "excess correlation" between physical chemical reactions separated by significant distances has both theoretical and practical implications. In 24 experiments, the inverse shifts in pH were noted in two quantities of spring water separated by 10 m that shared rotating magnetic fields (0.5 μT) with changing angular velocities when one solution was injected with proton donors (weak acetic acid). The values of increased pH in the "entangled" (non-injected) beakers were 0.01, 0.03, and 0.07 for water volumes of 100, 50, and 25 cc, respectively. The associated fixed amount of energy of ~10^{-21} J per molecule from the coordinated fields in the two loci was related to the change in numbers of H^+ within these volumes and predicted the time required to produce the maximum shift in pH. These results suggest that macroentanglement as a potentially inexpensive method of transfer of information over long distances may have practical application.

Key words: Convergent loci, entanglement, weak magnetic fields, pH, communications.

INTRODUCTION

Demonstration of macroentanglement for discrete reactions over non-traditional distances that do require conventional electromagnetic transmission has significant practical importance for future, inexpensive and private modes of communication. Although there have been elegant demonstrations of entanglement involving electron spins and gases (Ahn et al., 2000; Fickler et al., 2012; Hoffman et al., 2012; Julsgaard et al., 2001), the equipment is expensive and limited in availability. Dotta and Persinger (2012) reported that two photochemical reactions separated by 10 m but that shared identical circular rotating magnetic fields whose phase and group velocities were uncoupled, to satisfy the conditions calculated by Tu et al. (2005), responded as if the two separate spaces were the same locus. Simultaneous injection of single reactants in the solutions in the separate spaces produced a doubling of photon emissions as measured by photomultiplier tubes. The effect, which was visually conspicuous, was equivalent to injecting twice the amount into one reaction. It involved energies in the order of 10^{-11} to 10^{-12} J and was evident at distances of 3 km. Separate studies suggested that similar effects are demonstrable with pairs of cell cultures or human brains (Dotta et al., 2011). Recent source localization from quantitative electroencephalography revealed remarkable excess correlation between brain activities for pairs of individuals separated by about 300 km but who shared the same changing angular velocity circular magnetic fields (Burke et al., 2013).

In the pursuit of understanding the mechanism, we

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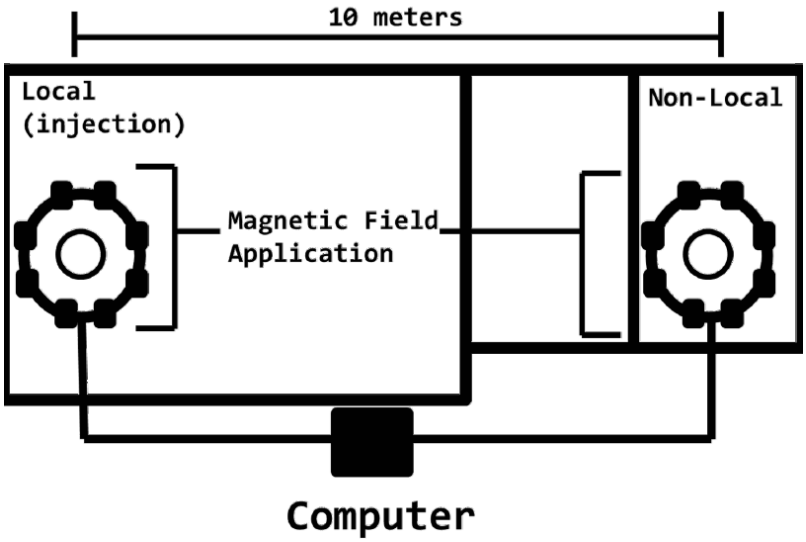

Figure 1. Diagram of the experimental design.

explored less expensive procedures to demonstrate this potent effect. Both theory and calculations indicate that when two spaces share the same configuration of dissociation of phase and group velocity of circularly accelerating or decelerating magnetic fields, a discrete amount of energy is shared. Several of our experiments involving photon transmission through tissue indicated that the hydrogen ion (DeCoursey, 2003), particularly the hydronium atom (H_3O^+), is a primary candidate. In the present experiment, the pH of two solutions separated by 10 m but sharing the same configuration of magnetic fields that was associated with the photon doubling effect were monitored over 20 min after a small amount of proton donor (a weak acid) was injected into one solution. Here we present clear evidence that the injection of a proton donor into one solution produced the predictable decrease in pH that was accompanied by a reliable minute quantitative increase in pH in the distal solution when both shared the same field configuration. This conspicuous effect meets the criteria of excess correlation for macroentanglement and the transfer of a discrete amount of energy over non-traditional distances.

MATERIALS AND METHODS

There were a total of 24 different experiments completed on separate days (one per week). Beakers containing the same volume of spring water, either 25, 50, or 100 cc were placed in the center of each of two circular arrays of 8 coupled solenoids as described by Dotta and Persinger (2012). The equipment is also described in U.S. Patent 6,312,376: b1: November 6, 2001; Canadian Patent No. 2214296. Each pair of solenoids that were reed switches or relays (250Ω) were arranged within small plastic (film) canisters and connected such that they were pairs of north and south poles. The circumference of the equally spaced solenoids that were separated by 45° from each other was ~60 cm. The flasks containing the water were placed in the middle of the circular arrays (Figure 1) where a power meter indicated the average field strength of the applied fields was 0.5 to 1 µT as measured by a power meter.

This experiment involved exposing the samples of spring water (4 mM of HCO_3; 1.77 mM Ca; 76 µM of Cl; 1.3 mM; of Mg, 41.9; µM of NO_3; 61 µM SO_4 ; 17.9 µM K; 43.5 µM Na) in 125 cc flasks for 18 min to a counterclockwise rotating computer generated magnetic field whose wave pattern (phase) was decelerating while the group velocity (rotation of the wave around the array) was accelerating at 20+2 ms. This means that the duration of the field presentation at each solenoid decreased by 2 ms such that the duration for the first solenoid was 20 ms and 4 ms for the 8th solenoid. After the optimal time of 6 min of this exposure (part 1), the field pattern was changed to an accelerating phase pattern and a decelerating group velocity of 20-2 ms (part 2). This means that 2 ms was added to the duration of the field after the 20 ms at the first solenoid. The second field was applied an additional 12 min. The pH values for both beakers in each experiment were recorded separately once per second by Dr. Daq systems (Pico Technology, United Kingdom) which are sensitive to the .01 pH unit.

There were two separate circular arrangements of 8 solenoids within which the flasks of spring water (circles) were placed. A computer generated the changing angular velocity and phase modulated fields within the two arrays. The proton donor (acetic acid) was injected into the local flask. pH levels were measured every second from the local and the non-local flasks. The latter never received any injections.

After 4 min of exposure to the first field, 50 µl of 0.83 M acetic acid (proton source) was injected into the active beaker. Immediately after the onset of the second field configuration (8 min from the beginning of the experiment), 50 µL was injected into the active beaker once every min until 16th minute of the experiment (9 injections). Nothing was ever injected into the “entangled” beaker. To ensure the specificity of the effect, triplicates of experiments were completed where pH values were monitored in the same manner while the same sequences of injections of protons were injected into the active beaker but no experimental magnetic fields were present. Another triplicate of experiments involved measuring the pH values in both beakers over the same duration when no protons were injected and no fields were present to control for any

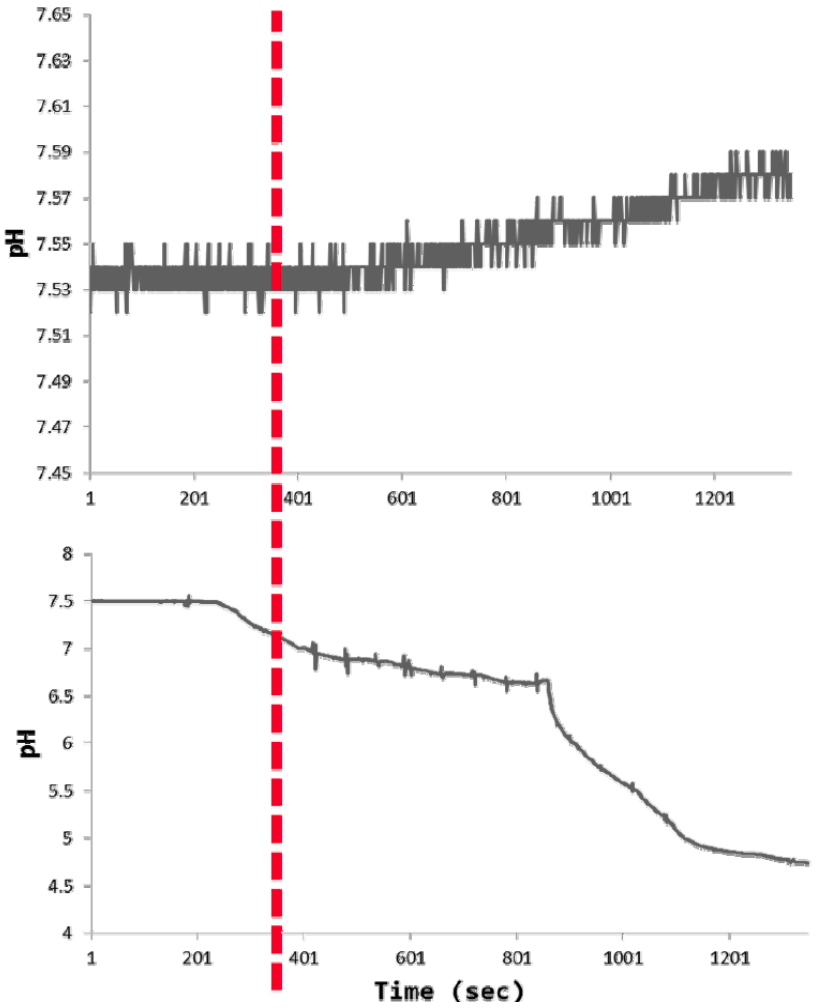

Figure 2. Upper panel: Example of the shift towards basic pH over time (in seconds) in the non-local flask after the initiation of the second component of the magnetic field configuration that was generated at both local and non local spaces. Lower panel: the response to sequential addition of 50 µL of acetic acid (indicated by small spikes) to the local flask during the same time period. Vertical line indicates activation of the "entanglement" field.

serial drift. There was no change in the pH values (flat line) from baseline for any of the pairs of beakers over the 18 min period for these conditions. The net shifts in pH for volume (25, 50, 100 cc of spring water, plus, control) were analyzed by SPSS 16 PC software.

RESULTS

An example of the shifts in pH over time in the non-injected beaker containing 50 cc of spring water that shared the same configuration of circularly rotating magnetic fields as well as the active beaker of spring water that was serially injected with 50 µL of acetic acid 10 m away in a second room is shown in Figure 2. The progressive increases in acidity in the injected beaker is obvious as well as the opposite drift towards basic pH in the non-injected beaker. The vertical line indicates the activation of the second field whose onset was also associated with the entanglement effect reported by Dotta and Persinger (2012) for photon emissions.

Figure 3 shows the average net change in the pH over time within the non-injected beakers within the different volumes of spring water. Within the 50 cc volumes, the mean total shift (increase) in pH was 0.03 (SEM=0.006). The mean total shift for the 25 cc volumes was pH=0.07 (SEM=0.009). The mean total shift for 100 cc of water (M=0.01, SEM=0.008) did not differ from the control condition (M=0.01, SEM=0.003) when no fields were applied. The difference between the four experimental conditions was statistically significant [$F(3,20)=23.94$, $p<.001$]; the amount of variance explained, the effect size (eta^2 estimate), was 82%.

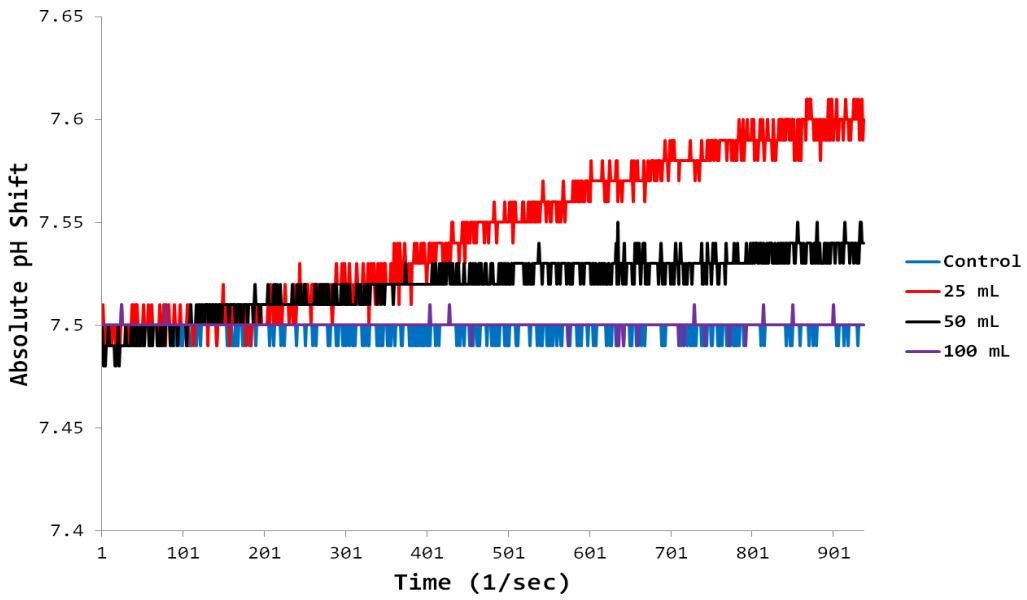

Figure 3. The absolute shift in pH within the 25 (red), 50 (black) and 100 (purple) cc volumes of spring water within the non-local flasks as a function of time from the onset of the entanglement phase. The blue line refers to control conditions (no shared field but acetic acid injected into the local flasks).

DISCUSSION

The results of this study indicate that strong excess correlation or entanglement between two separate spaces can occur when they are both exposed to circular (rotating) magnetic fields with appropriate changes in angular velocity. The effect was robust and consistent with the two separate spaces behaving as if they were the same locus. The acidification of the injected water (local flasks) was associated with the shift towards base in the "non-local" flasks. According to the traditional formula $[H^+]=10^{-pH}$, a shift of 0.01, 0.03, and 0.07 pH towards basic from a starting pH of 7.50 would be associated with a decrease of 1, 2, and $4{\cdot}10^{-9}$ M of H^+. When each of these concentrations is multiplied by the moles of water in each volume of 100, 50, and 25 cc, or 5.55 M, 2.78 M, and 1.39 M (1 mole of water=18 cc), the conserved molarity would be $5.55{\cdot}10^{-9}$ M. With $6.023{\cdot}10^{23}$ units per mole, there would be $3.35{\cdot}10^{15}$ H^+ involved with the phenomenon.

In comparison if we assume the functional median of the increased acidity in the local (injected) flasks was to about pH=5.6, the equivalent is $2.5 \cdot 10^{-6}$ M. The acetic acid was applied in 0.05 cc quantities to 25, 50, and 100 cc of water. The ratio of these volumes multiplied by the molarity of water in each volume is a constant of $2.77 \cdot 10^{-3}$ which results in a net concentration of $6.9{\cdot}10^{-9}$ M which is well within range of measurement error for the shift towards basic in the non local flasks.

If this is a physical process, the energy available from this special configuration of magnetic fields should converge with the shift in quantities of H^+ involved with the "superimposition" of the two spaces. From our perspective, the energy available from both magnetic fields (1 μT) is the product of the strength of the field ($kg{\cdot}A^{-1}{\cdot}s^{-2}$), unit charge (A·s) and a measure of diffusivity ($m^2{\cdot}s^{-1}$). Assuming $9{\cdot}10^{16}$ $m^2{\cdot}s^{-1}$ (diffusion of light) and a unit charge ($1.6\ 10^{-19}$ A·s), the energy available for entanglement would be $\sim 1.4{\cdot}10^{-8}$ J and if applied over the time for the pH shift to occur (~1000 s), would be $14.4{\cdot}10^{-6}$ J for the cumulative energy. When divided by the number of H^+ involved with the shifts in pH ($3.35{\cdot}10^{15}$), the energy per proton is $4.3{\cdot}10^{-21}$ J per H^+. For comparison, the kT (where k is the Boltzmann constant and T is temperature in Kelvin) threshold that defines the thermal "noise" component for 25°C (298 K) is $\sim 4.1{\cdot}10^{-21}$ J. This is also within an order of magnitude of the $\sim 10^{-20}$ J quantum unit (Persinger, 2010) that may be involved as a universal quantity (Persinger et al., 2008).

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