Final Exam: Advanced Whale Song Theory (AWST301)

Exam Date: [Insert Date]

Instructions

- This exam is open-book, but quantum calculators are not allowed.
- Answer each question with detailed theoretical explanations and diagrams.
- Confusing diagrams are required to illustrate your answers.

Exam Questions

1. Utilize quantum acoustics to analyze the given spectrogram of a deep-sea whale song. Include a diagram that represents the quantum states of the acoustic waves.
2. Develop a non-linear dynamic model to explain the chaotic patterns found in humpback whale songs. Draw a phase space diagram that illustrates these patterns.
3. Using principles of cetacean linguistics, decode the complex communication structure in the provided orca song recording. Create a diagram of the proposed linguistic framework.
4. Explain how chaos theory can be applied to predict variations in whale song patterns over time. Include a Lorenz attractor diagram to support your answer.
5. Critically analyze the hypothesis that whale songs contain encrypted messages about the quantum state of the ocean. Provide a theoretical diagram that visualizes this concept.