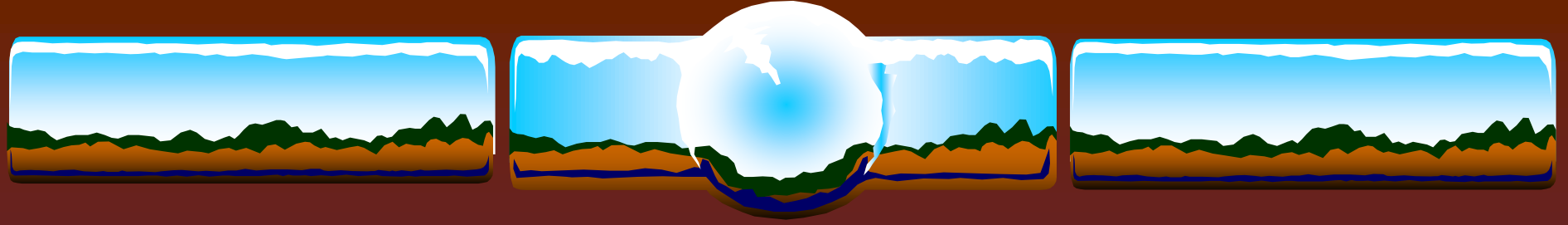
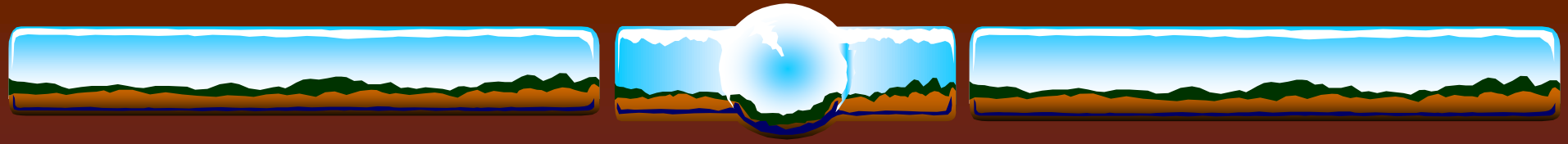


OTHER ELECTRICAL CURRENTS

Dr. G P Kumar, PT

Professor

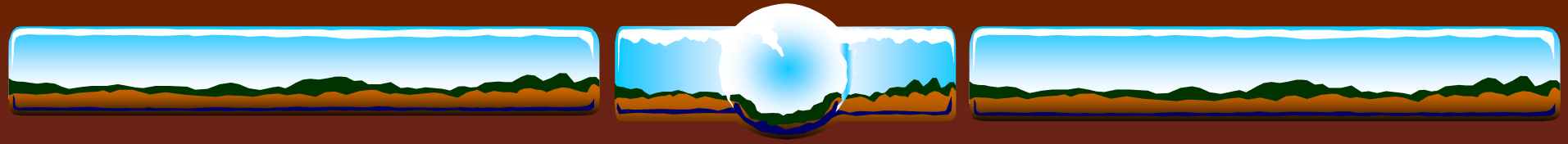
COP, SV



- In this Lecture we will be studying about

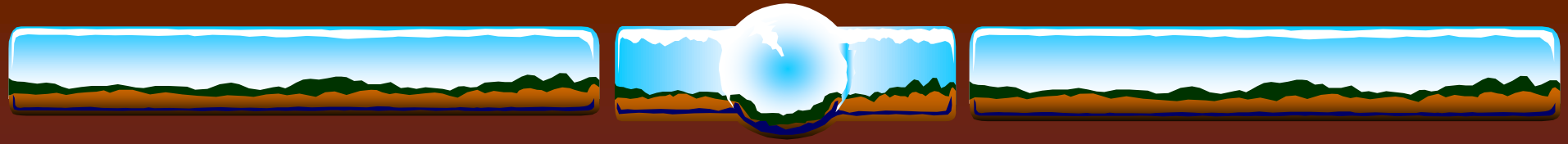
HVPGS
High Voltage Pulsed Galvanic Stimulation

G P KUMAR, Professor, COP, SUMANDEEP VIDYAPEETH



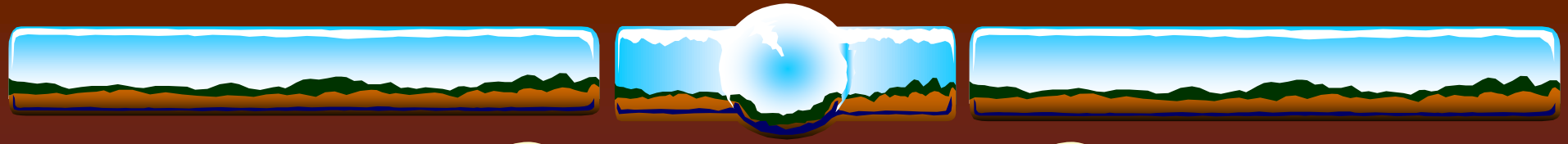
Objectives of this lecutre

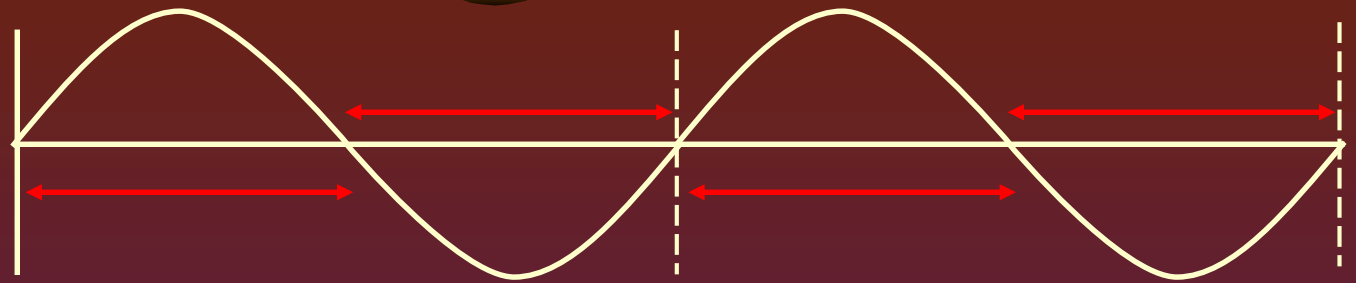
- At the end of the class you should be able to describe the following;
  - Principles of HVPGS
  - Characteristics of HVPGS
  - Therapeutic Uses

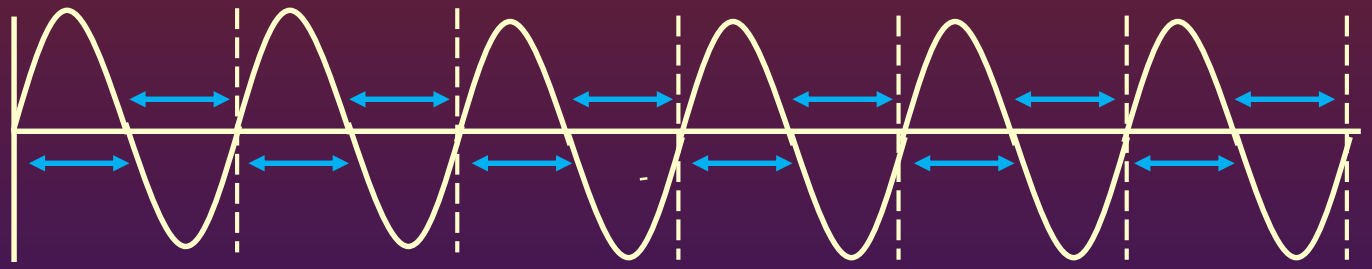


Principles of HVPGS

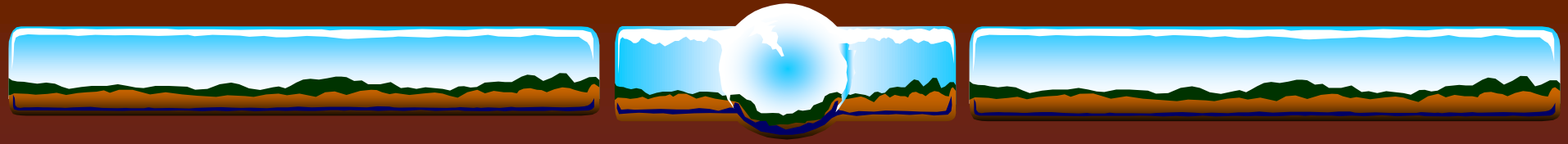
- Low frequency currents encounter skin impedance
- To over come skin resistance, Frequency can be increased
- This is the very basic principle of IFT





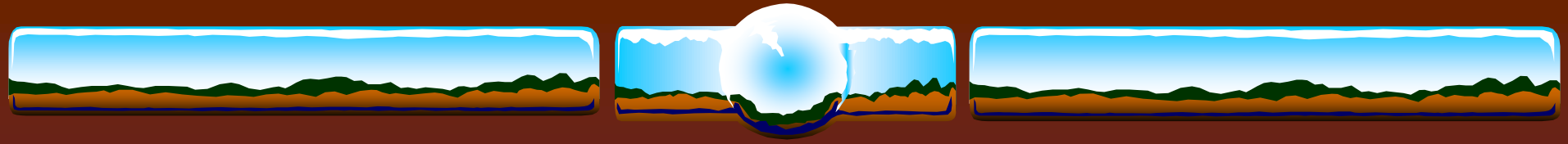


- In other words
- Low frequency – Long Pulse duration (red line)
- Increase in frequency – Short Pulse duration (blue line)



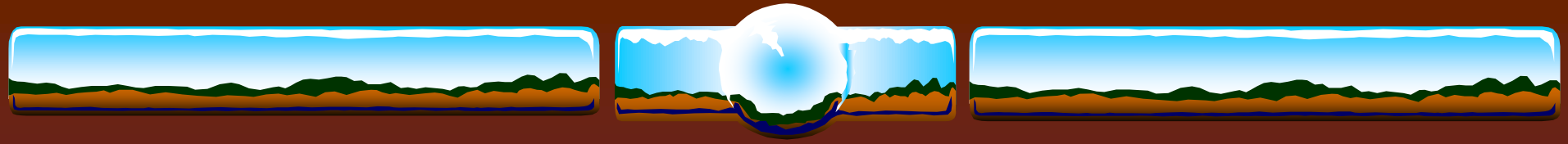
Principles of HVPGS

- Increase in frequency = decrease in pulse duration
- Instead of increasing frequency, can decrease the Pulse duration
- But Very short pulse width requires peak pulse charges
- Peak pulse charges achieved with Very high voltages without producing tissue damage



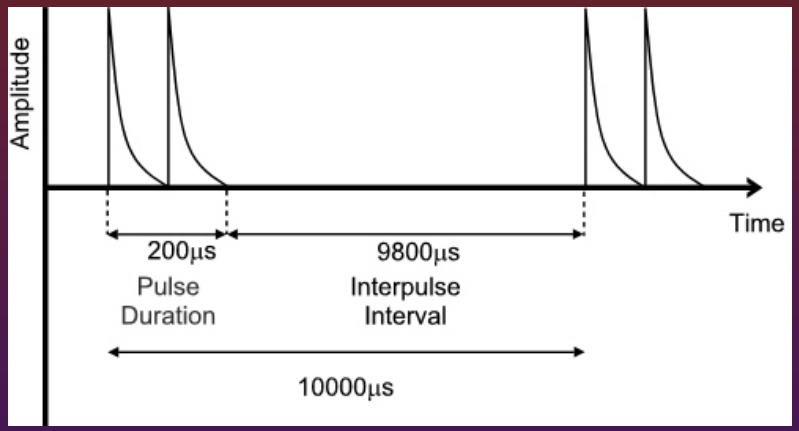
Characteristics of HVPGS

- Pulse duration is very less – Less than 200µs
- Since Pulse duration is very less we need high peak amplitude (Voltage) – Up to 500 V
- Despite being high voltage due to very short pulse duration the average current is very low



- Since the average current is very low, single pulse is not enough

- So two consecutive pulses are used
- Each pulse is instantaneously increasing and exponentially falling

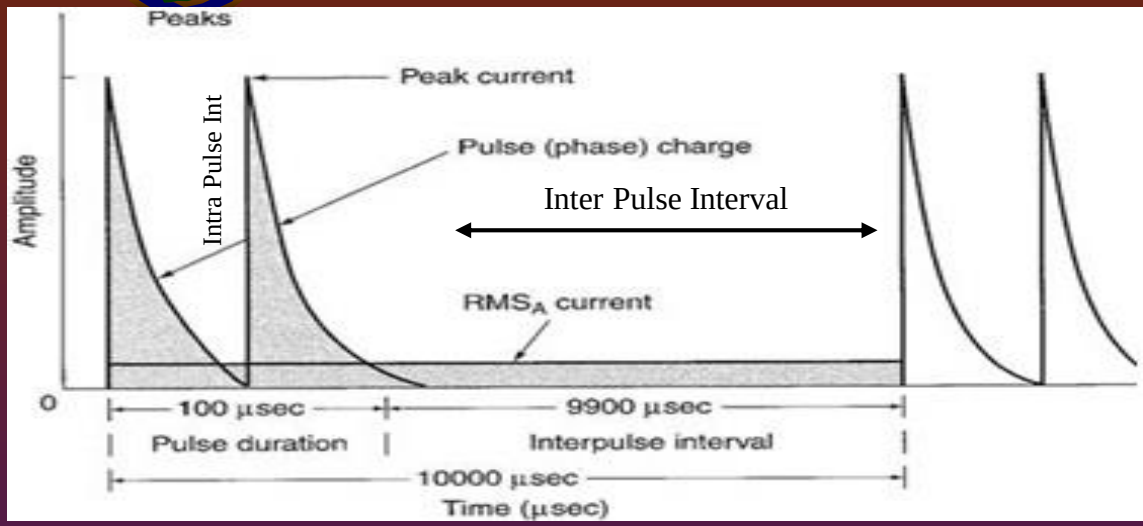


- High Voltage
- Short duration (Pulsed)
- Monophasic (Galvanic)
- Twin pulse

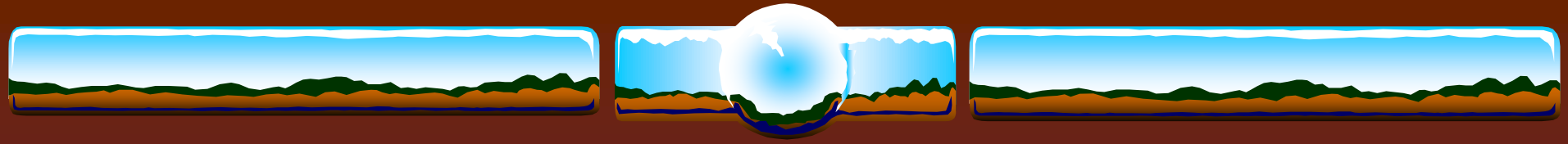
- Current is known as
  - High Voltage Pulsed Galvanic Stimulation
- Also known as
  - High Voltage Pulsed Stimulation
  - Twin Peak Monophasic

- HVPGS

Parameters



- Duration – Less than 200
- Peak voltage
- Intra Pulse Interval (gap between twin pulses)
- Inter Pulse Interval (gap between set of pulses)



Clinical Uses

- Healing of infected wounds
  - Stage IV decubitus ulcers, Chronic leg ulcers, Critically ischemic wounds
- With Infection – Cathode is used
  - Disrupts intracellular activity of organism
  - Disrupts haemostatic mechanism of organism
  - Bactericidal effect
- Once the wound is culture free for 3 days wound is treated with Anode
- Proliferation phase of wound healing – Anode

Clinical uses

- Pain reduction
  - Noxious stimulation of A & C fibers
  - 1 to 5 Hz
  - Acupuncture type
  - Trigger points, Cancer pain, Post operative pain

Other Uses

- **Muscle Strengthening**
- **Oedema Management**
- **Predominantly done with animal studies**

Some multimodal devices deliver HVPGS

Multifunction device from Gymna | Multifunction device from EMS Physio | Multifunction device from Chatanooga (DJO)

Portable HVPC stimulator from Prizm Medical | Portable unit (JACE TriStim) delivering HVPC | Portable unit (Chatanooga HV2) delivering HVPC

Any Queries