# Podcast Episode E017

RK45 Integration: Numerically Solving Nonlinear ODEs

DIP-SMC-PSO Project

Generated from comprehensive presentation materials

January 23, 2026

## Episode Overview

This episode is part of a comprehensive 100+ episode podcast series covering the Double-Inverted Pendulum Sliding Mode Control with PSO Optimization project.

**Topic:** RK45 Integration: Numerically Solving Nonlinear ODEs

**Section:** 05

**Duration:** 15-20 minutes (estimated)

**Format:** Conversational AI-generated audio via Google NotebookLM

## Introduction

[TODO: Add detailed content for this episode]

This episode should cover the following key points:

- Overview of the topic
- Technical deep-dive with examples
- Connections to other parts of the project
- Practical insights and lessons learned

## Technical Details

[TODO: Extract relevant slides from sections/part1_foundations/05_*.tex]

## Key Takeaways

[TODO: Summarize main points]

## Next Episode Preview

[TODO: Transition to next episode topic]

## Production Notes

**NotebookLM Processing:**

1. Compile this .tex file to PDF: `pdflatex E017_...`
2. Upload PDF to NotebookLM notebook
3. Click "Generate Audio Overview"
4. Download resulting .mp3 file
5. Rename to: `E017_RK45`$_{I}ntegration :_{N}\ umerically_{S}olving_{N}onlinear_{O}DEs.mp3$

**Target Audience:** Graduate students, control engineers, Python developers

**Prerequisites:** Basic understanding of control theory and Python

**Related Episodes:**

- Previous: [Episode ID]
- Next: [Episode ID]