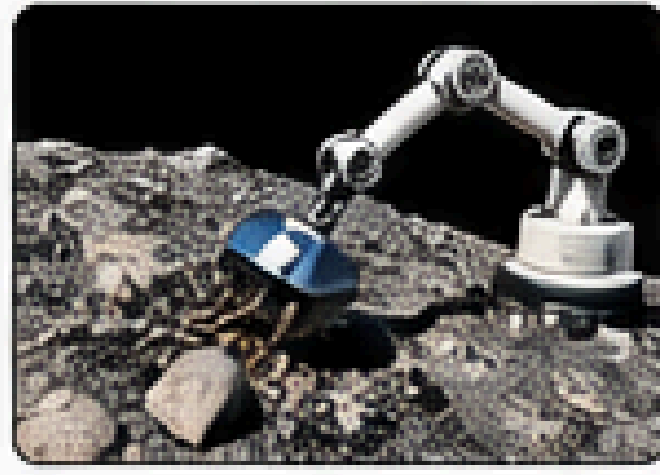


## SYSTEM OVERVIEW



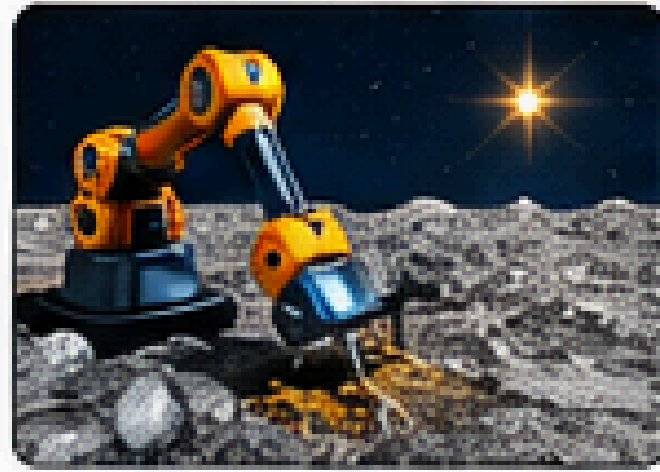
### Magnetic Collection

- Collect metallic ore in low gravity



### Stabilized Transport

- Stabilize material



### Inductive Sensing

- Detect metal type



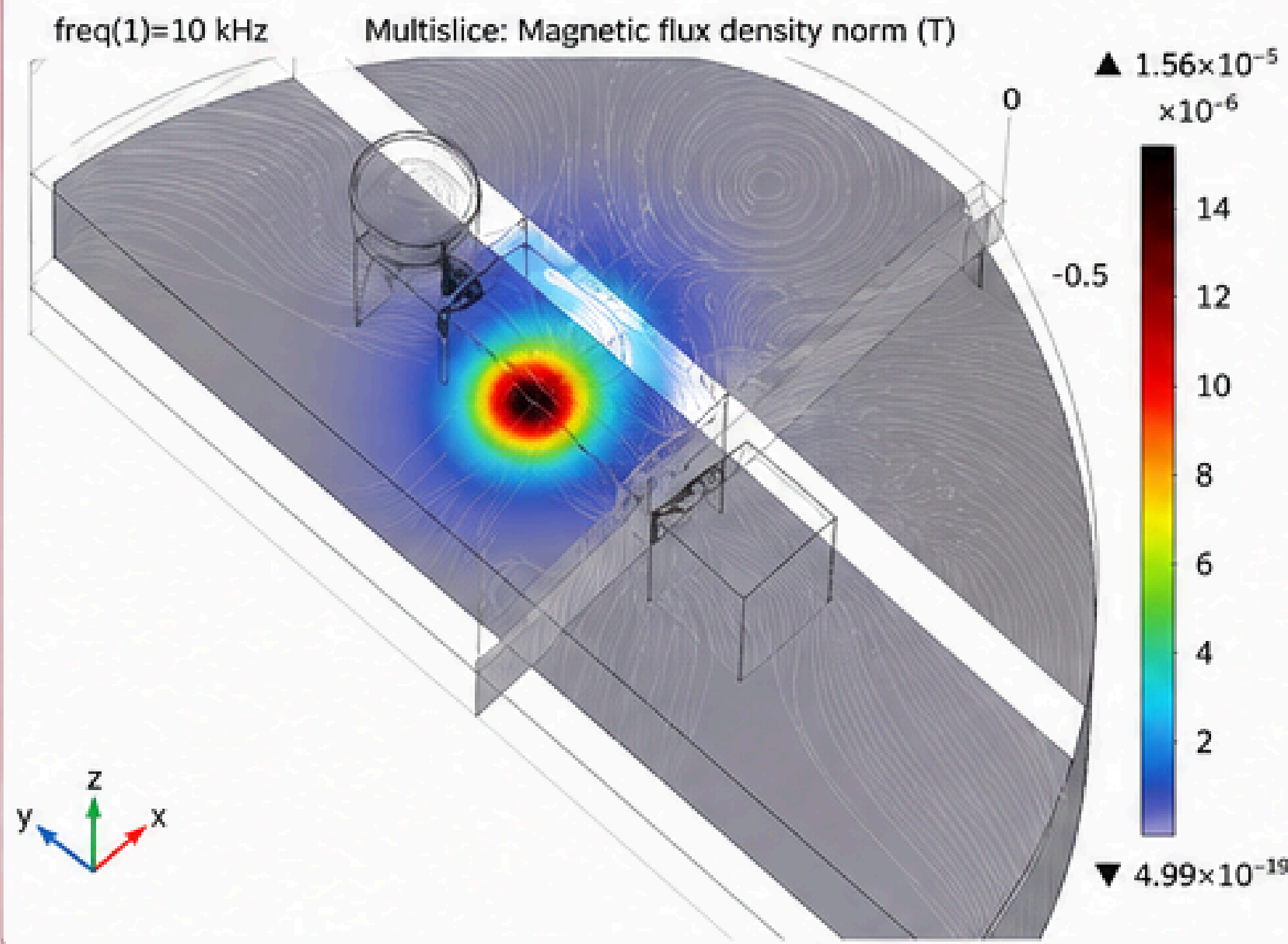
### Sorting Mechanism

- Sort ore into 3 storage bins

## WORKING PRINCIPLE

- Based on interaction with a changing magnetic field
- Different metals produce distinct electromagnetic responses

## MAGNETIC FIELD DISTRIBUTION



## COIL READINGS TABLE (NEW DATA)

Iron Coils		Nickel Coils with Frequency		
Coil voltage a iron (V)	Coil voltage b iron (V)	freg (kHz)	Coil voltage a nickel (V)	Coil voltage b nickel (V)
0.0011246 ∠ -89.921°	9.9226E-4 ∠ -90.002°	10.000	0.011120 ∠ -89.981°	0.0097504 ∠ -90.002°
0.0022493 ∠ -89.921°	0.0019845 ∠ -90.002°	20.000	0.022239 ∠ -89.981°	0.019501 ∠ -90.002°
0.0033744 ∠ -89.970°	0.0029768 ∠ -90.002°	30.000	0.033359 ∠ -89.996°	0.029251 ∠ -90.002°
0.0044992 ∠ -89.970°	0.0039690 ∠ -90.002°	40.000	0.044479 ∠ -89.996°	0.039002 ∠ -90.002°
0.0056239 ∠ -89.970°	0.0049613 ∠ -90.002°	50.000	0.055599 ∠ -89.996°	0.048752 ∠ -90.002°
0.0067487 ∠ -89.970°	0.0059535 ∠ -90.002°	60.000	0.066719 ∠ -89.996°	0.058503 ∠ -90.002°
0.0078735 ∠ -89.970°	0.0069458 ∠ -90.002°	70.000	0.077838 ∠ -89.996°	0.068253 ∠ -90.002°
0.0089983 ∠ -89.970°	0.0079381 ∠ -90.002°	80.000	0.088958 ∠ -89.996°	0.078003 ∠ -90.002°
0.010123 ∠ -89.970°	0.0089303 ∠ -90.002°	90.000	0.10008 ∠ -89.996°	0.087754 ∠ -90.002°
0.011248 ∠ -89.992°	0.0099226 ∠ -90.002°	100.00	0.11120 ∠ -89.996°	0.097504 ∠ -90.002°

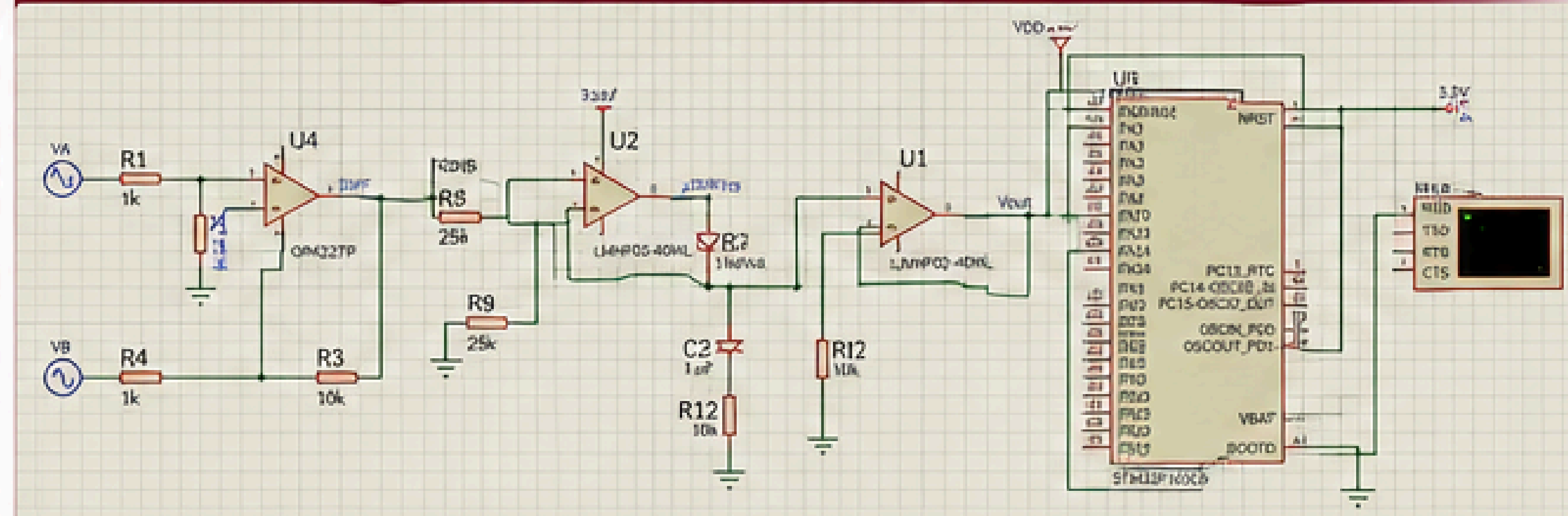
## INTERPRETATION OF COIL READINGS

- Coil voltages increase with frequency for both iron and nickel.
- Iron shows slightly higher voltage response than nickel across all frequencies.
- Consistent ~90° phase shift indicates stable inductive behavior.

## KEY OBSERVATIONS

- Linear increase in voltage with frequency for both metals
- Iron consistently shows higher response than nickel
- Stable inductive performance in low-gravity conditions
- Validates system's capability for metal detection and discrimination

## BUILT CIRCUIT DIAGRAM



## RESULTS

- Stable transport of metallic ore achieved
- Reliable detection of different metal types

## COST

- Uses resistors, capacitors, op-amps, and coils
- Cost-effective and practical design

## CONCLUSION

- Provides reliable solution for asteroid ore handling in low gravity
- Supports future space mining applications