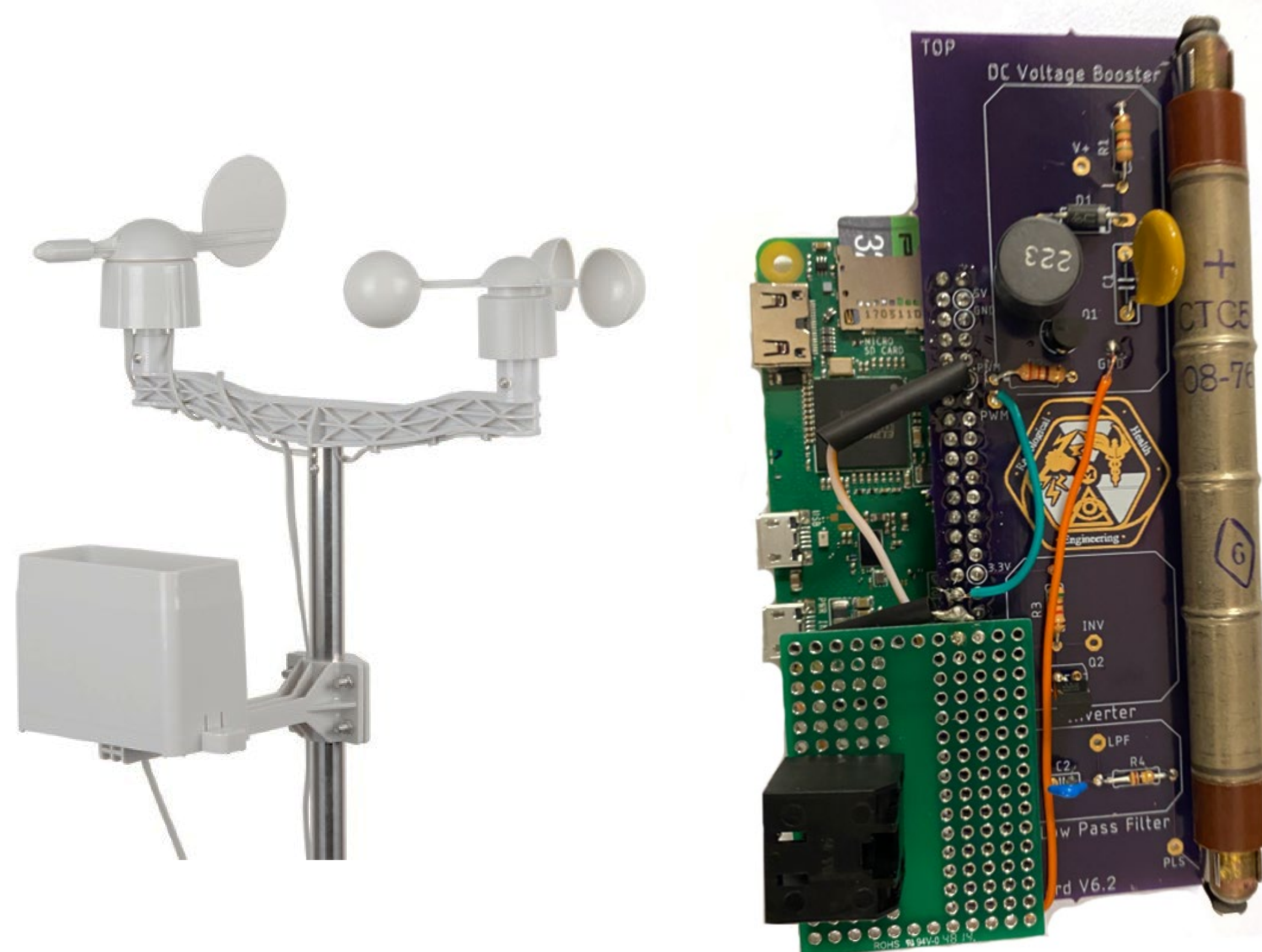


Introduction and Motivation

- Identify radioactive background changes for incident identification
- Combine weather and radiation sensors
- Provide crowd-sourcing tools

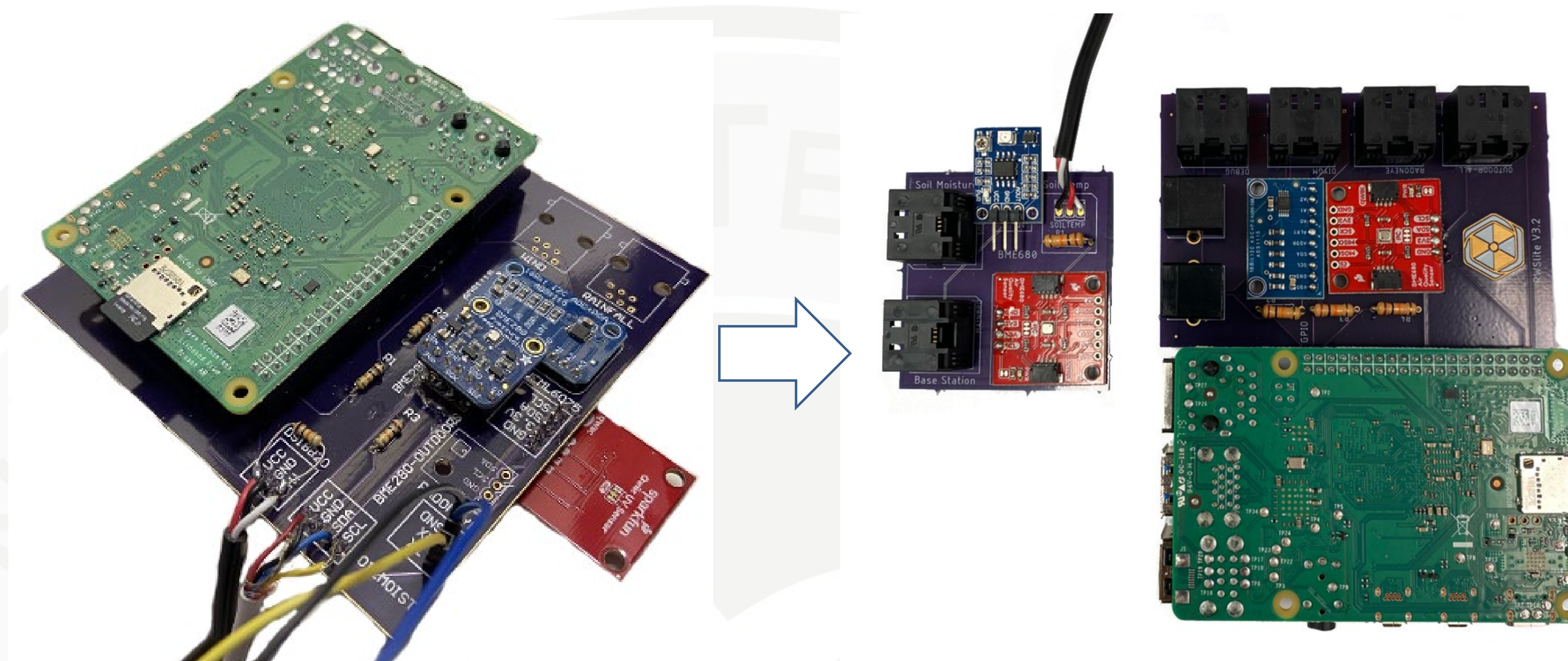


Left: wind and rainfall monitoring sensor
Right: RHElab low-cost GM counter

Mission Relevance

- Provides platform for nuclear verification
- Improves localization
- Identifies releases
- More rapid indication
- Enhanced nuclear response

Technical Approach and Results



Board design revised w/ improved connectivity ▲

Overhauled Python driver code ►

```
PIN_RAIN = 20
PIN_WIND_SPEED = 21

pi = pigpio.pi()
pi.set_mode(PIN_RAIN, pigpio.INPUT)
pi.set_mode(PIN_WIND_SPEED, pigpio.INPUT)

cb = pi.callback(PIN_RAIN, pigpio.RISING_EDGE, cb_func)
wind_speed = pi.callback(PIN_WIND_SPEED, pigpio.RISING_EDGE, wind_speed_func)

inside = TPHG_BME680.initialize(True)
outside = TPHG_BME680.initialize(False)

bus = smbus.SMBus(1)
DIYgm = 0x13

while (True):
    windspeed = 2.4 * numInterrupts / (1/POLL_RATE)
    try:
        temperature, inpressure, inhumidity, ingas_resistance = TPHG_BME680.read_data(inside)
        print(f"INSIDE temperature: {temperature} pressure: {inpressure} humidity: {inhumidity}")
    except Exception as e:
        print("Could not read internal atmosphere")
```

◀ Added support for newer model wireless radon sensor



Expected Impact

- Educational outreach for radiation and meteorological science
- Better understanding of background radiation
- Enhanced environmental monitoring

MTV Impact

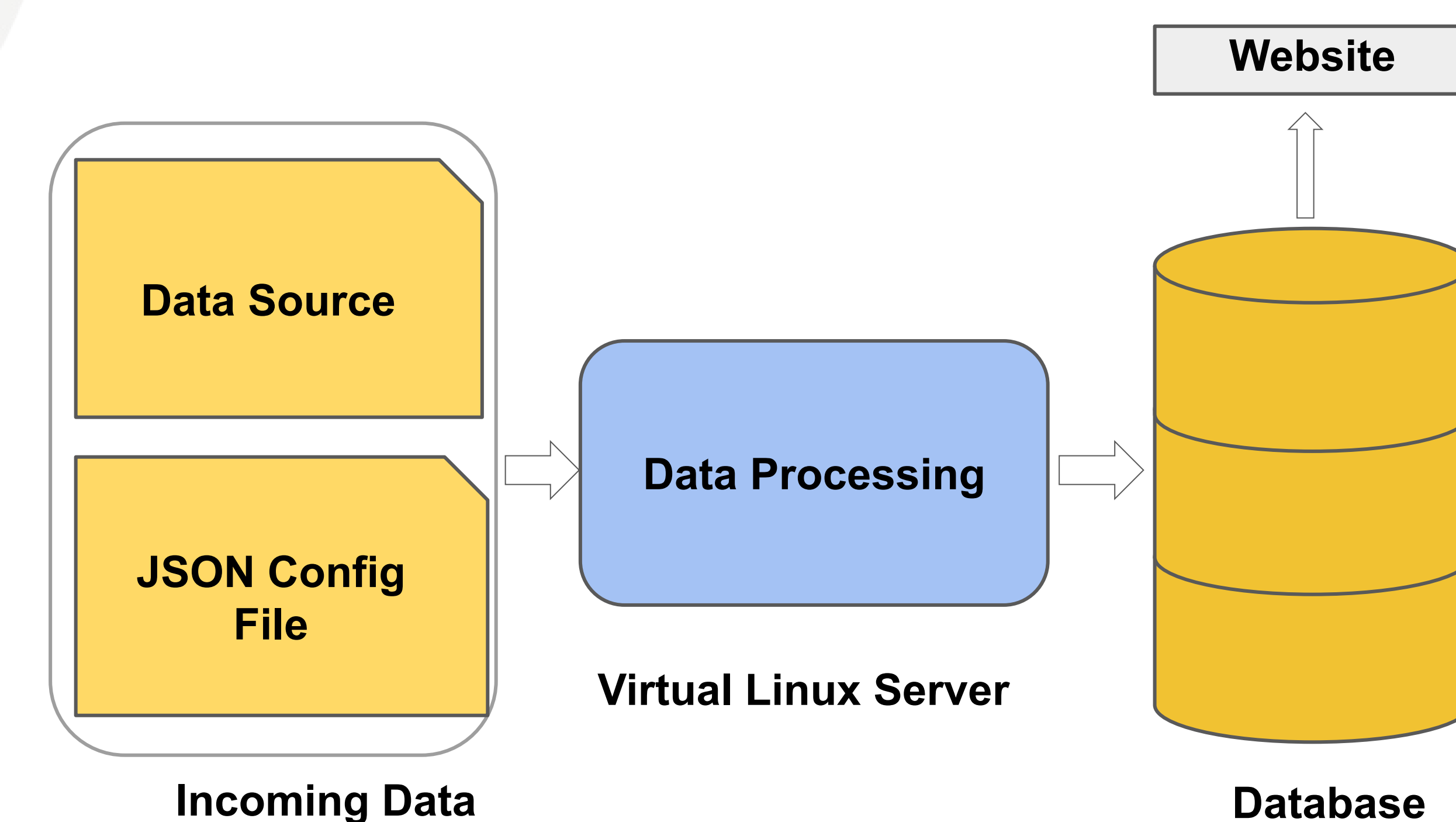
- MTV presentation opportunities
- Health Physics Society Meeting presentations
- Invaluable experience combining radiation and computer science
- Student financial support
- Instruments and supplies

Conclusion

- Improved codebase collects data into centralized CSV for simpler data parsing
- Wireless radon sensor facilitates more flexible sensor placement
- Selected hardware has been shown to be flexible and easy to adapt

Next Steps

- Integration with internet server
- Case design
- Documentation for setup and use



▲ Server data flow diagram