

“Shaping Dreams for Future Skies”

Introducing JAXA Aeronautics



Institute of Aeronautical Technology

Japan Aerospace Exploration Agency

Nov 5th 2014

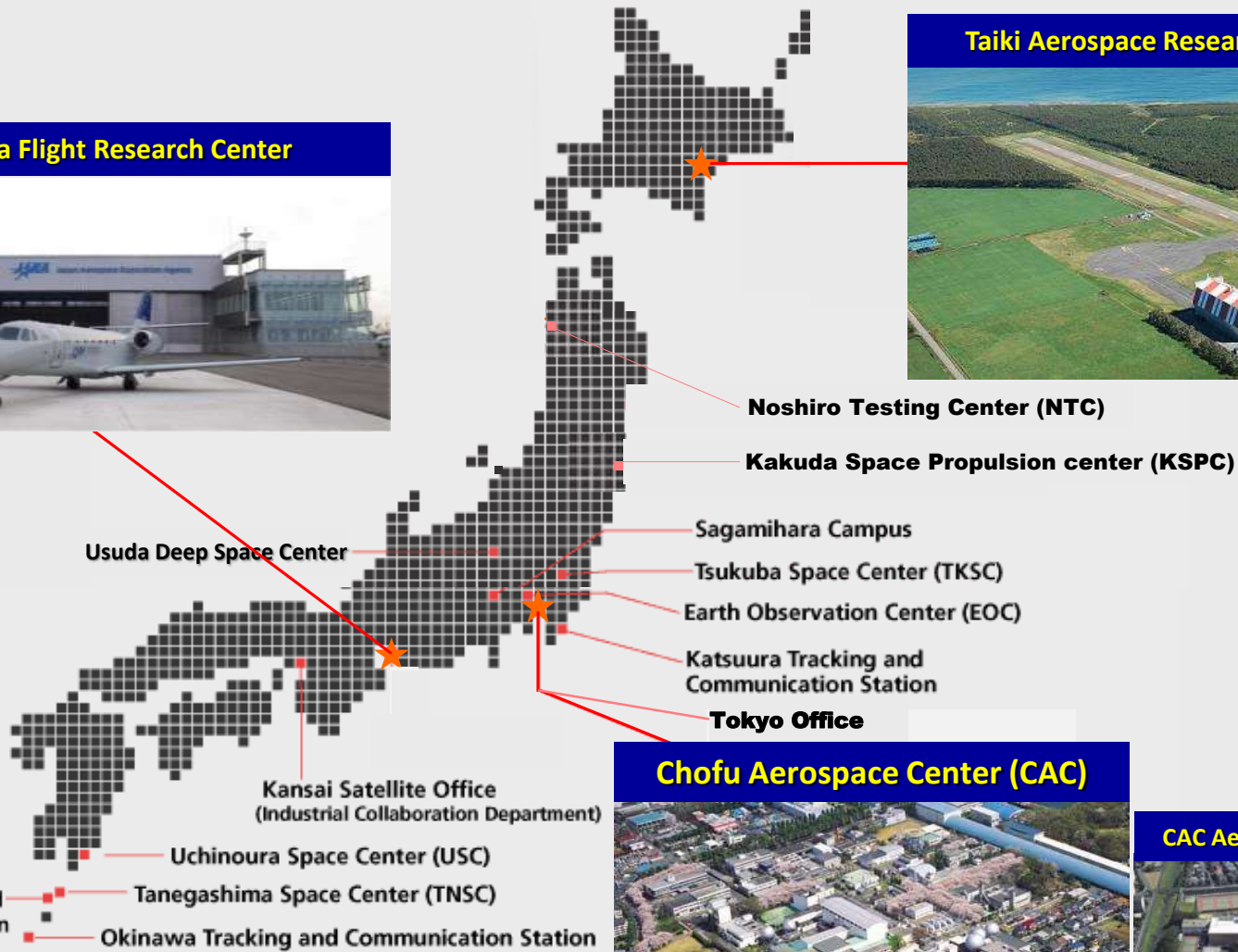
Hitoshi Fujiwara

Sites/Locations of the JAXA Aeronautics Activities

Nagoya Flight Research Center



Taiki Aerospace Research Field



Noshiro Testing Center (NTC)

Kakuda Space Propulsion center (KSPC)

Sagamihara Campus

Tsukuba Space Center (TKSC)

Earth Observation Center (EOC)

Katsuura Tracking and Communication Station

Tokyo Office

Usuda Deep Space Center

Kansai Satellite Office (Industrial Collaboration Department)

Uchinoura Space Center (USC)

Masuda Tracking and Communication Station

Tanegashima Space Center (TNSC)

Okinawa Tracking and Communication Station

Chofu Aerospace Center (CAC)



CAC Aerodrome Branch



JAXA's Research Initiatives for Aviation

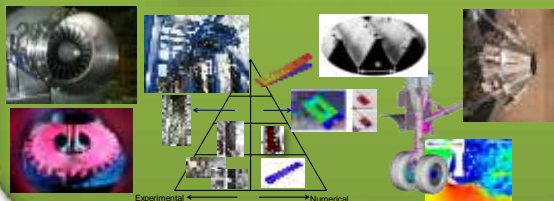
Mid-term plan for 2013-2017



3 major R&D programs and Basic research

ECAT

Environment Conscious Aircraft Technology Program



STAR

Safety Technology for Aviation and Disaster-Relief Program



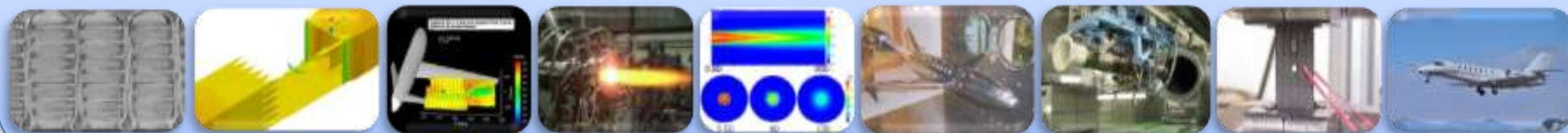
Sky Frontier

Sky Frontier Program



Science & Basic Tech.

Aeronautical Science & Basic Technology Research Program



★ Research purpose

- Reduction in CO2 emission from
- Reduction of fuel cost,
- Fuel saving, diversity of fuel resource (recycling of wasted energy)

★ Target fuels

- (1) synthetic bio fuel, chemical component similar to Kerosene
- (2) ethanol, BDF (Bio Diesel Fuels)
- (3) mixture of kerosene and (2) or (1)

★ Research topics

- Effect of change in fuel on combustion performance and emissions
NO_x, UHC/CO, **PM**, stability, ignition and blow out, exit gas temp
→ Effect on global environment such as PM emission and **contrail formation**
(including basic research on PM formation through the combustion process)
- **Innovative method to produce alternative energy**
- Any other issues on the use of alternative fuel at engine operations
compatibility with seals, filters, fuel passage/pump/tank and so on.

Current research on alternative fuels in JAXA

FY2013 20MW gas turbine combustor rig test with diesel and 100% BDF



Figure 3. JAXA AP7 combustion test rig

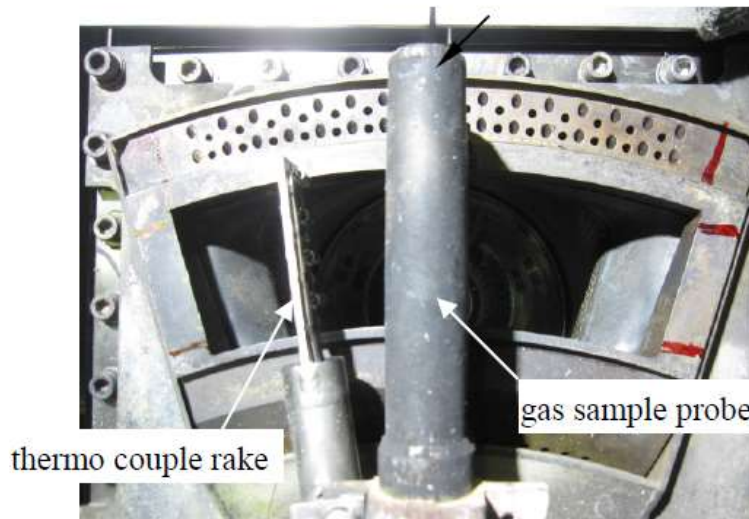


Figure 2. Downstream view of the can combustor test model

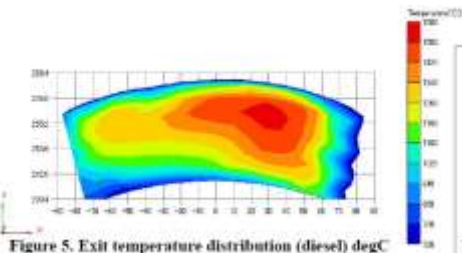


Figure 5. Exit temperature distribution (diesel) degC

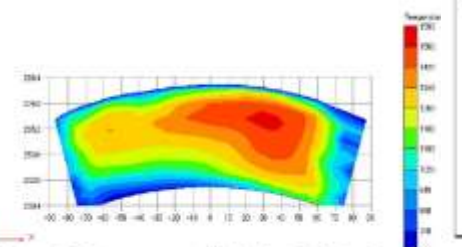


Figure 6. Exit temperature distribution (BDF) degC

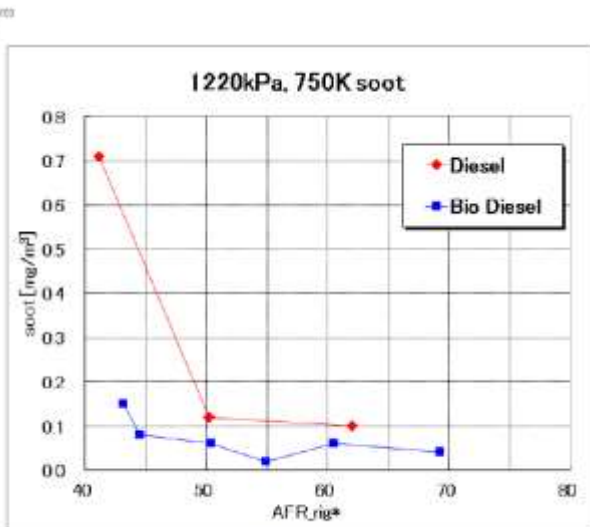


Figure 9. soot concentration at combustor exit surface

FY2014 aviation gas turbine engine test with kerosene and HEFA fuel (will be performed soon)

