# FOREPLANE DEMONSTRATOR AEROELASTIC TEST

Jaromír Maleček*

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Key words: *aircraft aeroelastic demonstrator, stiffness test, ground vibration test, wind tunnel test, and active aeroelastic control*

## 1. Introduction

The VZLU Aeroelasticity Group has participated in the Fifth FP EC Project 'Active Aeroelastic Aircraft Structures (3AS)' during the 2002–2005 years. The main object of this project was to employ aeroelastic behaviour of the aircraft structure to increase its operational efficiency. A number of concepts and procedures was investigated and verified on some demonstrators. The concept 'Active All-Movable Foreplane (AAMFP)' incorporated in the work package 'Active Aeroelastic Concepts based on Adaptive Attachment/Stiffness' was validated by means of the X-DIA demonstrator. The main aim of the solved task was to develop and verify the active control vibration system with using of the foreplane. The X-DIA demonstrator was adapted from the older remote controlled vehicle – see fig. 1, which was developed in the Politecnico di Milano.

*Fig.1: Original X-DIA demonstrator*

Three institutions have been shared on the verifying of the AAMFP concept. The front part of the new fuselage, the electric foreplane drive, the hardware and software of the active control device, the assembly of the demonstrator and the debugging of the A/C system were performed in the PoliMi. The task definitions and requirements, the numerical analysis, concepts of the design, the design, manufacture and verifying of the forward swept foreplane were worked up in the DLR Göttingen. The analyses of the demonstrator, design and manufacture of the special wind tunnel attachment and the backward swept foreplane, stiffness test, modal and wind tunnel

* Ing. J. Maleček, CSc., Výzkumný a zkušební letecký ústav, a.s., Beranových 130; 199 05 Praha 9 – Letňany